Care Staff Intentions to Support Adults with a Learning Disability to Engage in Physical Activity: An application of the Theory of Planned Behaviour

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Abstract

Background: This study investigates whether the Theory of Planned Behaviour is a viable model to predict the intentions of care staff to support adults with a learning disability to take part in physical activity. Previous research has suggested that people with a learning disability take part in less physical activity than those without disabilities. Research also shows that people with a learning disability have additional health needs when compared to the general population. Some conditions affecting people with a learning disability may be prevented or alleviated by increased physical activity. People with learning disabilities are sometimes dependent on their care staff to support them to access activities, therefore it is important to include care staff in planning interventions. The principal hypothesis of this research was that the Theory of Planned Behaviour may be a useful model in predicting the intentions of staff to support service users to engage in physical activity.

Method: Seventy-eight individuals who were keyworkers for adults with learning disabilities participated in this study. This study is based on the responses of these individuals as recorded on questionnaires at two distinct times. At time one, the respondents completed an adaptation of the International Physical Activity Questionnaire – Short Form (IPAQ-SF), and two questionnaires relating to the Theory of Planned Behaviour. At time two, the respondents completed a follow-up measure of physical activity using the IPAQ-SF. The questionnaires were distributed in a pencil-and-paper format, and were available online. Data were analysed using path analysis, an extension of multiple regression.

Results: A number of significant relationships between variables were demonstrated by the data. Perceived behavioural control was a significant predictor both of care staff intention and of the behaviour of the service user. Attitude was also a significant predictor of care staff intention. The data did not support that intention would mediate the relationship between attitude, subjective norm and perceived behavioural control and behaviour. Perceived behavioural control was the most significant predictor of intention and of behaviour.

Discussion: Results indicate that people with a learning disability take part in less physical activity than the recommendations for health. Perceived behavioural control was the most predictive variable in this population. The clinical and theoretical implications of this are discussed.

1 Introduction

1.1 Overview

It has been recognised that people with a learning disability may have additional and more complex health needs than those of the general population (e.g. Cooper *et al.*, 2006). Some of these seem to be more common in people with a learning disability, for example sensory impairments (Carvill, 2001). Others are thought to be syndrome specific, for example, Down's syndrome has been related to Alzheimer's disease and hypothyroidism (Kere *et al.*, 1996 cited in Fernando *et al.*, 2001). However, other health needs may be influenced by similar factors to those experienced by the general population e.g. coronary heart disease (Hollins *et al.*, 1998). Physical activity and diet are thought to be important in reducing the risk of many physical health difficulties (World Health Organisation, 2002), but research suggests that many people with a learning disability do not engage in physical activity on a regular basis (e.g. Messent *et al.*, 1998). Several factors have been suggested as influencing the extent to which people engage in physical activity in the general population, including personal, social and environmental barriers (The Scottish Executive, 2003). When considering physical activity for people with a learning disability, it may be necessary to consider the role of carers. Research has suggested that care staff can be influential in helping people with a learning disability to engage in physical activity (Hawkins & Look, 2006; Melville *et al.*, 2008).

The Theory of Planned Behaviour (TPB; Ajzen, 1988; 1991) has been used to develop a model with predictive powers for many health related behaviours including

giving up smoking (Willemson, 1996), attending health clinics (Norman & Conner, 1996), healthy eating (Chambers *et al.*, 2007) and physical activity (Norman *et al.*, 2000). This theory postulates that the main determinant of behaviour is the person's intention to perform a specific behaviour (e.g. 'I intend to exercise regularly over the next three weeks'). This is a person's motivation to perform behaviour and it is expected that people who have strong intentions will be more likely to exert the effort required in order to achieve their goals. Ajzen (1988; 1991) believes intention is determined by three constructs:

Attitude: A person's attitude towards a behaviour refers to their evaluation of performing the behaviour that can be negative or positive (e.g. 'Exercising over the next 3 weeks would be good/bad')

Subjective Norm: This refers to the perceived social pressure from others who are important to the person to carry out the behaviour (e.g. 'People who are important to me think I should exercise over the next 3 weeks')

Perceived Behavioural Control: This refers to the amount of control the person feels that they have over performing the behaviour. (e.g. 'Exercising regularly over the next 3 weeks would be easy/difficult').

To this author's knowledge, there has been no research carried out that looks at this model as applied to the physical activity behaviours of people with a learning disability. Recent research (Jenkins & McKenzie, 2010[1]) suggests both that this model can be predictive of intention to promote a healthy diet in people with a

[1] This recently published paper is based on the Doctoral thesis of Catherine Jenkins née Smyth

learning disability and that it can be applied to carers of people with learning disabilities.

The present study examines the extent to which the TPB model can predict carers' intentions to support physical activity in people with learning disabilities. The introduction will begin by providing a definition of and prevalence rates of people with a learning disability. This will be followed by a description of some of the health issues in relation to people with a learning disability. It will then discuss physical activity first in relation to the general population and then more specifically about physical activity and people with a learning disability. A section outlining some of the research about decision-making, and how carers of adults with a learning disability are involved in this will follow. The Theory of Planned Behaviour will be examined in more detail and this section will include some information about the strengths and limitations of the model, how it has been used in the research relating to physical activity and its use in changing health related behaviours. Examples of when this model has been used to predict the behavioural intentions of one group of people towards another will also be discussed. This will lead to the research questions and hypotheses.

1.2 Definition and Prevalence of Learning Disability

As a result of the closure of long-stay hospitals, many adults with learning disabilities now live in a community setting. For some people with a learning disability, this may mean they have less direct supervision and greater choice in some areas including making choices about participating in physical activity. Many people with a learning disability will require support from carers in their day-to-day life (Farmer, 1992). This section will outline the definition and prevalence of a

learning disability. This will help to set in context the numbers of persons with a learning disability within the UK, and more specifically in Scotland.

Various terms are used in the literature to describe people with a learning disability, including learning disability, intellectual disability and mental retardation. Although there are different terms and different definitions, they all appear to have the following three core criteria in common.

1. A person must be found to have a significant impairment of intellectual functioning
2. A person must have a significant impairment of adaptive and social functioning
3. These impairments should be evident before the person is 18 years old

(British Psychological Society, 2000).

All three of these criteria should be met in order for a person to have a learning disability. There has been a tendency for the focus of assessment to be on the impairment of intellectual functioning (British Psychological Society, 2000). This is reflected in the subdivisions that were applied to the severity of learning disabilities (e.g. Department of Health, 1999). People with mild to moderate learning disabilities may have more choice available in terms of physical activity than those with severe and profound difficulties (McGuire *et al.,* 2007). People with more profound difficulties may also be more like to have physical difficulties which may contribute to a lack of opportunity for physical activity (Robertson *et al.,* 2000). These subdivisions are made based on their intelligence quotient (IQ) scores. These subdivisions are outlined in Table 1.1.

Table 1.1: Table to show level of learning disability and corresponding IQ scores

Level of Learning disability	**Intelligence Quotient (IQ)**
Mild Learning Disability	50 – 70
Moderate Learning Disability	35 – 49
Severe Learning Disability	20 – 34
Profound Learning Disability	Below 20

More recent guidance from the British Psychological Society (BPS; 2000) does not use these subdivisions of mild, moderate, severe and profound. These guidelines instead refer to a person having a 'significant impairment in intellectual functioning' or a 'severe impairment in intellectual functioning' (British Psychological Society, 2000). The BPS (2000) recommends that decisions involving sub-classification of 'intellectual disability' should refer to both intellectual and to adaptive/social functioning. They also state that it is good practice to refer to the level of supports the person may require.

In Scotland, it has been estimated that around 2.4 per cent of the population have a learning disability. Of these, 2 per cent will have a mild or moderate learning disability and 0.4 per cent will have a severe or profound learning disability (Scottish Executive, 2000). More recently, a study undertaken by the Scottish Consortium for Learning Disabilities analysed the numbers of people with learning disabilities in Scotland who are known to services. Their finding indicated that there were 25,252 adults in Scotland with a learning disability, which equated to 5.9 people per 1000 (Scottish Consortium for Learning Disabilities, 2009). These figures are thought to be an underestimate as they only include people with a learning disability known to

services. These figures are similar to those reported within other parts of the UK (Department of Health, 1999).

The evidence suggests that prevalence of severe and profound learning disability is evenly distributed across the UK and across socio-economic groups (Department of Health, 2001). However, there seems to be a link between mild and moderate learning disabilities and poverty. There are more people with mild and moderate learning disabilities in deprived and urban areas (Emerson & Hatton, 2007). There have been similar findings in parts of Scotland (Martin & Cooney, in press). This may be of particular relevance as there is evidence that people from more deprived areas may also have poorer health and lower levels of physical activity (e.g. Giles-Corti *et al.*, 2002). Prevalence studies over time suggest that the number of people with a learning disability in the UK is increasing (McGrother & Thorp, 1999). Several of reasons have been put forward for this increase including advances in healthcare and medical technology (McGrother *et al.*, 2001).

This section has outlined the definition of learning disabilities. It has also outlined that the numbers of people in the population with a learning disability is increasing due to several factors. The next section will outline some of the health concerns that people with a learning disability have, over and above those of the general population. This will start to set the scene for the importance of health promotion that considers this population.

1.3 Health and People with a Learning Disability

There is evidence that, when compared with the general population, people with a learning disability face additional challenges. Some of these challenges may be due

to syndrome specific conditions such as hypothyroidism in people with Down's syndrome or people with Fragile-X syndrome who may have increased connective tissue disease, leading to cardiac abnormalities (Kerr, 2004). In addition, people with learning disabilities may find it more difficult to communicate their health conditions to professionals (Kerr, 2004) or they may find it more difficult to attend appointments due to physical barriers, such as physical disability or lack of transport (Lindsey, 2002). Some of these challenges have been outlined below. This evidence has implications for health promotion. The evidence listed here has been summarised from the Health Needs Assessment Report (2004) and Valuing People (2002).

Life expectancy is one of the major public health measures used to measure the health of the population. Although life expectancy is increasing for people with a learning disability, members of this group are still at a higher risk of dying early than those in the general population (Hollins *et al.*, 1998; McGuigan *et al*., 1995). The most common causes for death for people with a learning disability are different from those of the general population. Research suggests that the primary cause of death for people with a learning disability is respiratory disease (Hollins *et al.*, 1998; Puri *et al.*, 1995), as compared to coronary heart disease (Public Health Information Scotland, 2010) in the general population.

There are fewer deaths of people with learning disabilities from cancer in the UK as compared to the general population. However, the number of people with a learning disability diagnosed with cancer is increasing and this may be in part explained by the fact that people are living longer (Cooke, 1997; Duff *et al.*, 2001). Research has also found higher rates of gastrointestinal cancer in people with a learning disability (Cooke, 1997; Duff *et al*., 2001).

There is a paucity of studies about coronary heart disease (CHD) in people with learning disabilities in the UK, even though the second most common cause of death amongst people with learning disabilities in CHD (Hollins *et al*., 1998). The number of people with a learning disability being diagnosed with CHD is increasing. This is believed to be due to the increased longevity of people with a learning disability and also with lifestyle changes associated with not living in long-stay hospitals (Turner & Moss, 1996). In addition, there has been increased access to health screening for people with a learning disability which is likely to have had an impact on the numbers of people who are diagnosed with health conditions (Cooper *et al.*, 2006). Nearly 50 per cent of people with Down's syndrome have some form of congenital heart problems, this rate is much higher than that of the general population (Brookes & Alberman, 1996; Hermon *et al.*, 2001). Data from the Northern Region Cardiology database estimates the prevalence of congenital heart disease in the general population to be between 5.2 and 6.9 per 1000 live births (Wren & O'Sullivan, 2001).

The prevalence rates that are reported for anxiety and depression amongst people with learning disabilities are varied, but are thought to be at least as prevalent as the rates are in the general population (Stavrakaki, 1999). These rates are said to be higher amongst people with Down's syndrome (Collacott *et al.*, 1998). Research by Cooper and colleagues (2007) found a higher prevalence of affective disorders in people with a learning disability than had been found in previous studies (6.6 per cent as compared to 4 per cent). They found a number of factors that were associated with affective disorders in people with a learning disability including obesity. Their findings did not support those of Collocott *et al.* (1998), that people with Down's

syndrome have an increased risk of depression. This study had a number of strengths. For example, it used a large sample size and it had a systematic way of collecting the same information about all the participants. It was a cross-sectional design, which means it is impossible to tell if the associated factors predict depression, or arise as a result of depression. For example, does being obese makes you more likely to become depressed or are you more likely to become obese if you are depressed?

There is evidence that people with learning disabilities are at an increased risk of problems with their weight. This includes both being overweight and being underweight (Messent *et al*., 1998; Robertson *et al.*, 2000; Wood, 1994). There are subgroups of people with learning disabilities that seem to be more likely to be at risk of obesity; such as people with Down's syndrome, women, people who are considered more able and people who live in environments with less supervision (Prasher, 1995; Robertson *et al.*, 2000). The literature suggests that less than 10 per cent of adults with learning disabilities eat a balanced and healthy diet. There is also evidence in the literature that some people with a learning disability have a lack of knowledge and choice with regard healthy eating (Robertson *et al.*, 2000; Rodgers, 1998). These people will often have an insufficient diet lacking in fruit and vegetables (Rodgers, 1998).

As will be discussed in section 1.6, many people with learning disabilities engage in less physical activity than the minimum recommended by the Department of Health. Messent *et al.* (1998) found that 93 per cent of people with a learning disability did not meet the recommended levels of physical activity. Between 53 and 64 per cent of people in the general population engage in levels of physical activity below the minimum recommendations (Messent *et al*., 1998; Robertson *et al*., 2000). People

with lower ability levels who live in environments with more restrictions in place are at increased risk of having lower levels of physical activity (Robertson *et al.*, 2000). Challenging behaviours are shown by up to 10 to 15 per cent of people with learning disabilities (Emerson *et al*., 2001). This can be a factor in whether or not people access community activities to engage in physical activity (Messent *et al.*, 1999). People with learning disabilities have been found to have substantially lower bone density than the general population (Aspray *et al.*, 1998). They, and particularly those of them with epilepsy, are more likely to sustain fractures (Jancar & Jancar, 1998).

In summary, people with a learning disability have health care needs additional to those experienced by people in the general population. Some of these health concerns have similar risk factors to those of people in the general population, and physical activity is thought to be a modifiable risk factor in these. The following section will outline definitions of physical activity and the measurement of physical activity.

1.4 Physical activity guidelines and measurement

This section will outline the definition of physical activity, and the amounts that are recommended for health.

1.4.1 Definition of 'Physical Activity'

The World Health Organisation (2002) defines physical activity as ‘any force exerted by skeletal muscles that results in energy expenditure above resting level’ (pg 2).

This broad definition allows many types of physical activity to be included as well as exercise and sport.

1.4.2 What are the Recommendations?

Internationally, there seems to be some consensus that in order to improve and maintain health one should meet three criteria. These criteria are the time, intensity and frequency of physical activity (Department of Health, 2004; Scottish Executive, 2003).

1. All adults should accumulate 30 minutes or more of physical activity (time)
2. Physical activity should be of at least moderate intensity (intensity)
3. This physical activity should take place on at least five days a week (frequency)

Moderate intensity is defined as enough to raise the heartbeat and leave the person feeling warm and slightly out of breath - the equivalent of brisk walking. There are difficulties with measuring physical activity that will be examined in more detail in the following section.

1.4.3 Measurement of Physical Activity

There are several ways of measuring physical activity, both indirectly and directly. The most common way of measuring physical activity is by the use of recall questionnaires (Sirard & Pate, 2001). These can be by self-report and interview administered questionnaires (either in person or by telephone). Some of the limitations of using these questionnaires are: that they rely on the ability of the participant to recall accurate information (Matthews, 2002); participants may answer in a socially desirable manner (Timperio & Salmon, 2003); people may have a tendency to over-estimate the physical activity that they undertake (Flesges *et al.*, 1990) and they may not understand what is meant by physical activity (Sirard &

Pate, 2001). However, measuring physical activity in this way is inexpensive (Sirard & Pate, 2001) and it is not overly intrusive or onerous on participants. Finlay and Lyons (2001) state that there may be additional problems in measuring physical activity in people with learning disabilities due to fact that people with a learning disability are prone to acquiescence and may answer in the way they think the researcher wishes them to.

The International Physical Activity Questionnaire (IPAQ) is a standardised instrument with extensive reliability and validity information, for both the long form (LF) and the short form (SF), from 12 countries (Craig *et al.,* 2003). This questionnaire is used extensively in research to measure physical activity and gives scores in MET/minutes. A metabolic equivalent, or MET, is a unit of measurement used for describing the energy usage of a specific activity. A MET is the ratio of the rate of energy expended during an activity to the rate of energy expended at rest (Ainsworth *et al.,* 1993). These scores can be further categorised into 'Low', 'Moderate' and 'High' levels of physical activity. This questionnaire was normed with middle-class participants and Craig and colleagues (2003) have suggested that there is a query about the generalisability of this measure in more diverse populations.

When using measures with a proxy respondent, such as a parent or teacher about a child or a carer about an adult with learning disabilities, there are similar issues to those with self-report measures. In addition, research using proxy measurements often fails to report the reliability and validity of the measures (Sirard & Pate, 2001). However, the use of proxy measurements does help to address some of the issues of

acquiescence and any cognitive limitations that the person with a learning disability may have.

Diaries have also been used in research and are thought to be an accurate and cost-efficient way of eliciting information. However, they are more onerous for participants to complete (Matthews, 2002), and also there may be a Hawthorne effect (Landsberger, 1955: cited in Roethlisberger & Dickson, 1939), where people engage in an activity more because they are aware it is being recorded. Diaries may not always be completed or returned by respondents. There are also more direct measures of physical activity such as observation by the researcher, or the use of motion sensors such as pedometers and accelerometers. These give accurate information about the levels of physical activity a person takes part in but are time-consuming and expensive (Dale *et al.*, 2002).

This section has outlined the definition of physical activity, the recommended levels and some of the methods of measurement. There are a variety of ways that physical activity can be measured and each has its own strengths and limitations. The next section will examine some of the physical and psychological benefits of physical activity in more detail.

1.5 Physical and Psychological Benefits of Physical activity – Research from the General Population

Research into the role of physical activity in the prevention and treatment of some health conditions has been carried out extensively within the general population, often in subpopulations such as people with CHD or diabetes. This research suggests that there is a role for physical activity in the prevention and treatment of some health conditions. This section outlines a brief selection of this research.

A lack of physical activity has been identified as one of the most significant risks to health globally (World Health Organisation, 2002). Chronic health conditions such as diabetes, cancer, obesity, hypertension and osteoporosis, osteoarthritis and cardiovascular disease have been linked with a lack of physical activity (Chakravarthy *et al.*, 2002; Warburton *et al.*, 2006). Physical inactivity is for most people, a modifiable risk factor (Warburton *et al.*, 2006).

There have been many studies over the years that have examined the risk of death from certain diseases (e.g. cardiovascular disease) associated with physical inactivity (Berlin & Colditz, 1990; Blair *et al.*, 2001; Kohl, 2001; Lee & Paffenbarger, 2000). For example, Blair *et al.* (1989) conducted a study involving healthy men and women who were middle aged. They measured fitness using an exercise treadmill. They found that those who were in the bottom 20 per cent of the physical fitness scale had an increased risk of premature death relative to those in the 20 per cent who were most physically fit.

Physical activity has been associated with a decreased risk of type 2 diabetes (Chakravarthy *et al.*, 2002; Helmrich *et al.*, 1991; 1994; Warburton *et al.*, 2006). Helmrich *et al.* (1991) undertook a large prospective study and they found that for every 500 k/cal increase in energy expenditure per week, the likelihood of contracting type 2 diabetes decreased by 6 per cent. This benefit seemed to be accentuated in people who were at a high risk of diabetes type 2, such as those with a high body-mass index. These findings have been supported by other research (Manson *et al.*, 1992; Gregg *et al.*, 2003). Williamson *et al.* (2004) reviewed a number of randomised control trials and found that weight loss through a

combination of diet and physical activity reduced the incidence of diabetes by 40 to 60 per cent over 3 to 4 years.

There have been published reviews that suggest a link between a reduction in cancer and routine physical activity (Lee, 2003; Shepherd & Futcher, 1997; Thune & Furberg, 2001). This seems especially true in the case of cancers such as colon cancer and breast cancer (Sesso *et al.*, 1998).

Physical activity, in particular when it involves resistance training, appears to have an effect on bone mineral density. In a review by Warburton *et al.* (2001), it was shown that people who took part in resistance training were more likely to have increased bone mineral density compared with people who did not. They also found that people who participated in high impact sports (e.g. running, weight training) had an increased bone density as compared to those who took part in low impact sports (e.g. yoga, walking).

There is an association between routine physical activity and improved psychological well-being. This has been shown in reducing anxiety (Dunn *et al.*, 2001; Warburton, 2001), reducing stress (Warburton, 2001), and reducing depression (Dunn *et al.*, 2001). Scully *et al.* (1998) reviewed the literature about physical exercise and psychological well-being. They concluded that physical exercise has a positive impact on people with depressive symptomatology and this was most pronounced in clinical populations. They also concluded that anxiety was alleviated by exercise. They also found that people who were physically fit showed a reduced psychosocial stress response.

Martinsen (1990) conducted a review of the literature that looked at the effects of physical activity in people who were diagnosed as suffering from clinical depression. He found that people with clinical depression tended to be more sedentary. He found that people who continued to exercise after a one-year training program had lower depression scores than those who were sedentary. He also found that patients found it to be an acceptable form of treatment. North *et al.* (1990) conducted a meta-analysis that included over 80 studies and 290 effect sizes. Their results indicated that physical activity reduced clinical depression. They found that both aerobic and non-aerobic exercise were effective at reducing depression. The evidence suggests that physical exercise may help to alleviate depression. Limited evidence suggests that aerobic exercise is more helpful and that it is more effective if sustained over time (Dunn *et al.*, 2005).

Several reviews and meta-analyses conclude that physical activity is helpful in reducing anxiety. For example, Landers *et al.* (1994) found that, regardless of what kind of anxiety measure was used, the results indicated that there was link between physical activity and anxiety reduction.

The research in the general population suggests that physical activity is beneficial in a number of different health complaints, both physical and psychological. The next section will examine the research more specific to people with a learning disability.

1.6 Physical activity and People with Learning Disabilities

The previous section outlined some of the benefits of physical activity for people in the general population. There is evidence that suggests physical activity can have a wider impact for people with a learning disability including: contributing to a

reduction in difficult behaviours (Gabler-Halle *et al*., 1993), reducing levels of self-injurious behaviours (Baumeister & MacLean, 1984) and also increasing acceptance, and integration into the wider community (Rimmer, 1993). Despite these benefits, when the fitness of people with a learning disability was compared to the general population it was found that both men and women were less active and only seven per cent of adults with a learning disability undertook more than one hour of moderate exercise per week (Messent *et al.*, 1998).

There is a subset of people with learning disabilities who probably take part in higher levels of physical activity; these are the people who take part in the Special Olympics. The Special Olympics Great Britain group was formed in 1978 as part of the worldwide Special Olympic group that was founded in the USA in 1968 by Eunice Kennedy Shriver. There are currently 135 Special Olympics groups in the UK and 8,000 athletes who are a part of this group. This equates to about 0.6 per cent of people with learning disabilities (Special Olympics Great Britain, 2010).

Research suggests that most adults with a learning disability are less active than adults in the general population (Bange *et al.*, 1995; Draheim *et al.*, 2002; Emerson, 2005; Messent *et al.*, 1998; Robertson *et al.*, 2000; Temple & Walkey, 2007). There have been several methodological weaknesses in these studies such as a small sample sizes (Draheim *et al.*, 2002; McGuire *et al.*, 2007; Messent *et al.*, 1998; Temple & Walkey, 2007). Other difficulties include the studies being limited by using cross-sectional design rather than longitudinal design (Draheim *et al.*, 2002; Emerson, 2005; McGuire *et al.*, 2007; Robertson *et al.*, 2000) and being restricted to adults with mild or moderate learning disabilities (Draheim *et al.*, 2002; Messent *et al.*, 2002) or in specific supported living environments (Emerson, 2005; Robertson *et al.*,

2000). These methodological difficulties may affect the generalisability of the results to all adults with learning disabilities who live in the community.

Finlayson *et al.* (2009) attempted to address some of these weaknesses by comparing the levels of regular physical activity undertaken by adults with learning disabilities with the levels for the general Scottish population that had been previously determined. One of the strengths of this study was that it used a large community based sample of people with learning disabilities. They examined the different types of physical activity that adults with a learning disability who are living in the community engage in, in terms of participation, frequency, duration and intensity. In addition, they hoped to determine the factors that predict low levels of physical activity. They found that people with learning disabilities were significantly less likely to participate in physical activity than people in the general population. When people with a learning disability did take part in physical activity, it was likely to be of a shorter duration. Only 5 per cent of people with learning disabilities met the recommended level of physical activity (Scottish Executive, 2003). In this paper, the barriers to physical activity were found to include having health difficulties such as epilepsy, immobility and having faecal incontinence. Older age was also found to be independently predictive of a lack of physical activity. Other factors that were predictive of lower levels of physical activity included having a lack of daytime opportunities and residing in shared facilities with highly supervised care.

Finlayson *et al.* (2009) also discuss the implications of the research and suggest that service providers should engage more with paid (e.g. support workers) and unpaid (e.g. family carers) carers of people with a learning disability to help encourage an active support ethos. They suggest people with learning disabilities should be

encouraged in even the most basic everyday living tasks as well as helping them to engage in physical activities. Their research also suggests that walking is the physical activity most people with learning disabilities take part in, and therefore it might be useful to develop walking interventions for people who have the physical ability.

As will be discussed in more detail in the next section, it is necessary to consider training needs of carers supporting adults with learning disabilities (NHS Scotland, 2003). It is regarded as important to involve carers in changes to the lifestyle of a person with a learning disability, especially with regard to dietary change and physical activity (Fox *et al.*, 1985; Hamilton *et al.*, 2007). It has also been suggested that a carer's resistance to change is a significant barrier to promoting healthy lifestyle choices and behaviour (Lunsky *et al.*, 2003).

Melville *et al.* (2009) examined carer knowledge and beliefs around dietary intake and physical activity. The research was designed in order to ascertain if carers are aware of existing public health recommendations on diet and physical activity. It also investigated which benefits of consuming a healthy diet and taking part in physical activity carers recognised as being important to people with learning disabilities. Carers may perceive that people with learning disabilities face additional problems in making healthy choices about diet and physical activity. This study also sought to identify these barriers. This research found that paid carers had a generally poor knowledge about both diet and physical activity. They reported that 18 per cent of carers had no knowledge of the three parts (frequency, duration and intensity) of the public health recommendation of 30 minutes of moderate activity on least five days a week. They found 11.5 per cent of carers knew all three of these criteria, and this group were the only carers who knew the frequency recommendation. The majority

of carers (82 per cent) felt that the person whom they supported would benefit from increased levels of physical activity. The carers felt that increased physical activity would improve the people's quality of life (98.4 per cent), improve their general health (96.7 per cent), reduce their risk of disease (93.4 per cent), help them to live longer (90.2 per cent) and manage their weight effectively (83.6 per cent). Less emphasis was put on looking slim (47.5 per cent) or feeling attractive (42.6 per cent) by the carers in this sample. In terms of physical activity, the carers who were participants in this research felt the primary barriers to people with learning disability accessing physical activity were the knowledge and skills of people with a learning disability, and their motivation. The carers gave a lower rating to external barriers such as transport and finance, which is contrary to previous research (Hawkins & Look, 2006). There are some limitations to this study: the participants were recruited through professionals in the community learning disability teams, and may have been subject to sampling bias. It is not clear whether professionals are more likely to identify people who they perceive as being more or less likely to have a healthy lifestyle. It may be that paid carers were less likely to participate if they felt the person that they support did not have a healthy lifestyle. There is also limited information available on the reliability and validity of the questionnaire used in this study.

The research suggests that people with a learning disability undertake less physical activity than people in the general population, despite there being many perceived benefits to their participation in physical activity. One of the factors that has been identified as important is the role of both paid and family carers in encouraging

people with a learning disability to take part in physical activity. This will be examined in more detail in the next section

1.7 People with Learning Disabilities and Decision-Making

Previously, it was outlined that people with a learning disability have additional health needs when compared to the general population, and that these needs are often not met. Research has indicated that a number of psychological factors can influence health-related behaviour in the general population including behavioural intention, motivation and perceived benefits and barriers (e.g. Armitage & Conner, 2000). Making a decision to engage in a health promoting behaviour, such as taking part in physical activity, can therefore be a complex process, involving many factors. This section will outline issues relating to choice, capacity and duty of care.

Policies and practice guidelines have suggested recommendations for facilitating decision-making and choice for people with learning disabilities (Stalker & Harris, 1998). Changes to societal views about people with a learning disability have been lead by philosophical movements. In particular, the 'principle of normalisation' (Wolfensberger, 1972), 'social role valorization' (Wolfensberger, 1983) and the 'Five Accomplishments for Service Delivery' (Tyne & O'Brien, 1981), have influenced the recognition of the importance of choice for people with learning disabilities. The principle of normalisation involves the acceptance of people with a learning disability into society, allowing them the same rights and conditions as other citizens. These include what are considered the normal conditions of life – housing, schooling, employment, exercise, recreation and freedom of choice. There has been a suggestion that these should also include 'the dignity of risk', as opposed to the emphasis on 'protection' (Bank-Mikkelsen, 1976). Social role valorisation is based

on the idea that society tends to identify groups of people as fundamentally 'different', and of less value than everyone else. It catalogues the methods of this 'devaluation' and analyses its effects. The ‘Five Accomplishments for Service Delivery’ were aimed at focusing and guiding support staff in their work, and they explicitly identify the promotion of choice for the client as an indicator of good quality service provision. O’Brien (1989) detailed the ‘Five Accomplishments for Service Delivery’ as:

- **Community Presence:** The right to take part in community life and to live and spend leisure time with other members of the community.
- **Relationships:** The right to experience valued relationships with non-disabled people.
- **Choice:** The right to make choices, both large and small, in one’s life. These include choices about where to live and with whom to live.
- **Competence:** The right to learn new skills and participate in meaningful activities with whatever assistance is required.
- **Respect:** The right to be valued and not treated as a second-class citizen.

There is a widespread promotion of choice for people with a learning disability, but there is also some reference in the literature to ‘duty of care’ and the influence that carers can have on choice. The literature regarding choice-making for people with a learning disability with reference to exercise and physical activity is sparse. This literature will be discussed and then literature relating to healthcare decisions and people with learning disabilities more generally will be discussed.

Messent and Cooke (1999) published a review that was designed to look at two main questions regarding physical activity and people with a learning disability. The first question was whether inequalities of opportunity exist between people with learning disabilities and the general population. The second question attempted to address the issue of whether the provision of equal opportunities should be considered a basic human right. There was limited research to review but some important points were raised. They argued that the levels of physical activity that people with a learning disability undertake cannot be considered 'normal'. They state that if people with a learning disability were empowered to adhere to 'normalisation' in relation to physical activity then level of fitness and obesity should be similar to that of the general population. They go on to argue that many models of behaviour that are used in the general population may not be applicable to people with a learning disability as they assume that behaviour is volitional and that barriers apply to the individual, whereas this may not be the case for people with a learning disability. They suggest that the advice given to the general population may not be relevant for people with learning disabilities. They discussed some of the barriers to accessing physical activity that are specific to people with a learning disability such as staffing ratios and suitable community facilities. Messent and Cooke then discuss rights, liberty and justice. They discuss that for a person to have a 'real' choice, it is necessary to provide them with appropriate support. An example they use is that an individual with a learning disability may not be able to go for a walk if they are not able to leave their home/daycare without supervision.

McGuire *et al.* (2007) conducted a study about the lifestyle and health behaviours of adults with a learning disability. This was a questionnaire based study with carers

(both familial and staff) of people with a learning disability in the west of Ireland. The results of this study were compared to a health survey of the general population in the same area. The survey found that adults with a learning disability had lower levels of smoking and alcohol consumption than people in the general population. It also found that people with a learning disability were less likely to participate in physical activity. They also examined the level of choice that people had in health related behaviour including diet, physical activity, smoking, alcohol consumption, and attendance at healthcare appointments. This study indicated the level of choice diminished as the severity of the learning disability increased. However, greater choice did not seem to indicate any difference in health behaviours than when the service user had low amounts of choice. This suggests that carers of people with a learning disability should also be targeted when developing health promotion materials for this group, as they may be involved in facilitating decisions about the person's lifestyle choices.

Smyth and Bell (2006) reviewed the literature about the issues of choice for people with learning disabilities. The focus of their review was on issues of food and diet and the implications that this could have on general health for people with a learning disability. Their work identified a number of individual and care management factors that influence the choices of people with a learning disability. An important conclusion in this review was that the 'duty of care' for a person with a learning disability must continue to be kept in mind when supporting people with a learning disability; they also commented that care staff attitudes and beliefs are likely to affect decision-making for people who receive support. Although the focus of this paper

was on diet, many of these factors may also be key in supporting people with a learning disability to take part in physical activity.

A recent study by Ferguson *et al.* (2010) looked at healthcare choices of people with a learning disability. This study examined the role of carers in supporting people with a learning disability to attend appointments. It was a small-scale qualitative study, and it highlights some interesting themes, though the results may not be generalisable. They were particularly interested in attendance at physiotherapy appointments. They found that people with a learning disability in this group recognised that the support they were given about making choices about healthcare was beneficial. Care staff also highlighted the importance of choice when interviewed. For example, one member of care staff said *'He may as well be back in the hospital as far as I'm concerned if he's not able to have these choices'* (pg 6). However, other interviewees described situations where they would support their client to make the 'best' choice, or where they would over-rule specific decisions. Physiotherapists were also interviewed in this study, and they recognised that care staff are put in a difficult situation when trying to balance the choices their clients make with 'correct choices'. One member of physiotherapy staff described the ideal situation as one in which '*they (carers) make as full an attempt to educate and promote health issues with the client and get them to make their own choice'.* (pg 7). Ferguson *et al.* discuss roles and responsibilities and the need for training and support in their conclusions. They recommend that care staff may benefit from training about what constitutes a meaningful choice. They also recommend that staff should be aware of their influence on the decision and choices made by the people they support. They describe how the attitudes held by carers can have a significant

impact on the choices made by people with learning disabilities. An example from the literature was a young woman with a learning disability who did not attend cervical screening appointments because her mother did not (Fovargue *et al.,* 2000: cited in Ferguson *et al.*, 2010).

Harris (2003) provides an overview of the current understanding of the concept of choice. This paper describes some of the models of choice, and outlines the difference between normative and descriptive models of choice (Jenkinson, 1993). Normative models describe how people make decisions in order to make the best of their goals in idealised situations. Harris (2003) refers to the fact that the idealised situation rarely takes place, and choices tend to be affected by other factors. Descriptive models of choice are concerned with how people chose in real-life settings, and they recognise there are a range of influences on this. Harris (2003) also discusses choice in relation to a person's capacity to make decisions. He argues that the criteria that need be met in order to have capacity to make a decision may be unrealistic, as they assume that choice is made without the influence of other people. These criteria state that for a person to have capacity they must be able to:

- Receive information;
- Retain information long enough to recognise that a decision is needed;
- Consider what options for action are available;
- Consider the implications of each option;
- Consider the implications of not choosing;
- Make a decision; and

- Communicate that decision to other people

(Lord Chancellor's Department, 1997).

The Adults with Incapacity Act (Scotland) (2000) and the Mental Capacity Act (England and Wales) (2005) have similar criteria for recognising when people are deemed incapable of certain decisions. The Adults with Incapacity Act does specifically include the views of carers, and promotes the development of skills about choice making. Harris (2003) continues the paper by discussing influences on choice; in particular social and environmental influences on choice. He concludes that making choices is a complicated process, and to overlook the contributions that can be made from the social influences, such as professionals and carers, may be unwise. Harris' conclusions have a specific relevance when thinking about the role of care staff in facilitating decision-making for people with a learning disability.

In summary, carers often assist people with a learning disability with decision-making. This makes it important that carers, as well as adults with learning disabilities, be taken into account when designing interventions.

1.8 Models of Behavioural Change

In the previous sections, it was outlined that a lack of exercise can have negative health consequences both physically and psychologically. This is true for the general population and for people with learning disabilities. One potential way of tackling this issue in people with learning disabilities may be through working with their carers. As previously discussed, carers have a major impact on the lives of people with learning disabilities, and the attitudes of the carers and the behaviours of the carers may influence the people for whom they care. Therefore, it may be important

to target carers and try to increase the likelihood that they will encourage their clients to partake in exercise. Theories of behavioural change may be useful in helping to achieve this. The next section briefly reviews these models before going on to examine the theory of planned behaviour in more detail.

The health belief model postulates that a person's health related behaviour depends on the perception of the person in four main areas: the severity of the potential illness, the person's susceptibility to that illness, the benefits of taking preventative action, and the barriers to taking that action (Rosenstock, 1966). This model also incorporates cues to action (e.g. leaving a note to remind oneself to go for a walk) into the model as being important in the maintenance of behaviour (Becker, 1974). In addition, self efficacy has been added to the model (Rosenstock, 1990) and this addition may allow the model to better account for habitual behaviours.

Protection motivation theory (Rogers, 1985) suggests that health-related behaviours are the product of five components. These components are divided into coping appraisal and threat appraisal. Perceived vulnerability, perceived severity and fear determine threat and response efficacy and self-efficacy determine coping. The threat and coping then determine the positive health behaviour (adaptive coping) or the negative health behaviour (maladaptive coping).

Social cognitive theory (Bandura, 1986) postulates that behavioural change is affected by environmental influences, personal factors and attributes of the behaviour itself. Each may affect and be affected by either of the other two. A central concept to social cognitive theory is the concept of self-efficacy (i.e. their capability to perform the behaviour). This theory suggests in order to perform a given behaviour a person must possess self-efficacy, and that that they must perceive an incentive to

perform this behaviour. In addition, they should value the outcomes they believe will occur as result of undertaking the behaviour.

In the transtheoretical model (Prochaska & DiClemente, 1984), behaviour has been conceptualised as a five-stage process related to a person's readiness to change. These stages are: precontemplation, contemplation, preparation, action and maintenance. People are thought to progress through these stages at various rates, and may move back and forth through stages before reaching the goal of maintenance.

In both the theory of reasoned action (Fishbein & Ajzen, 1975) and the theory of planned behaviour (Ajzen, 1988), intention determines behaviour. In the theory of reasoned action, intention is moderated by attitude and subjective norm. In the theory of planned behaviour, the additional variable - perceived behavioural control - is included in order to adjust for external barriers. These will be discussed in more detail in section 1.9.

In studies that compare the above models, the theory of planned behaviour has been found to be the best predictor of behaviour (Connor, 1994; Quine, 1998).

1.9 The Theory of Planned Behaviour

In the previous sections, it has been outlined that physical activity has important implications in maintenance of health and in prevention of some health complaints. This is the case for the general population and also for people with a learning disability. The literature reviews a variety of models that may be applicable when researching physical activity. These include the health belief model, social cognitive

theory and the theory of planned behaviour (TPB). There is evidence that the TPB is one of the most helpful (e.g. Baranowski *et al.*, 2003; Blue, 1995; Godin, 1994). This section will outline briefly the development of the TPB. In addition, it will define the variables that are involved in the prediction of behaviour by this theory. The strengths and limitations of the theory will be discussed.

The TPB is an extension of the Theory of Reasoned Action (TRA; Fishbein & Ajzen, 1974). The TRA suggests that a person's intention to perform a behaviour is dependent on a person's attitude about that behaviour and subjective norms. The TRA and TPB share these variables and they are defined as follows:

Intentions are the measure of an individual's desire to carry out a specific behaviour, and are seen as the step preceding the performance of a behaviour. The stronger an individual's intention to perform the behaviour, the more likely they are to subsequently carry it out (Armitage, 2005).

Attitudes are defined as the positive or negative evaluation of a behaviour; the more positive an attitude towards performing a behaviour, the more positive the intention to perform that behaviour (Armitage & Conner, 2001). Attitudes are determined by the combination of salient beliefs with relevant outcome evaluations. Fishbein (1967) argues that only those beliefs most important to an individual determine their overall attitude.

Subjective norm measures the degree of social pressure an individual believes they are under to perform a behaviour (Ajzen, 1991). This has generally been more narrowly defined as pressure from persons important to an individual (Ajzen & Fishbein, 1980).

The TRA assumes that if a person intends to do a behaviour that is under their control then it is likely that the person will carry out this behaviour. In addition, the intentions of a person are the function of two things: the person's attitude towards the behaviour and the subjective norm. The TRA states that a person's volitional behaviour is predicted by their attitude toward that behaviour and how they think other people would view them if they performed the behaviour. According to TRA, a person's attitude, combined with subjective norms, forms their behavioural intention.

However, Fishbein and Ajzen (1974) suggest that attitudes and subjective norms are not weighted equally in predicting behaviour (cited in Miller, 2005).

> 'Indeed, depending on the individual and the situation, these factors might be very different effects on behavioural intention; thus a weight is associated with each of these factors in the predictive formula of the theory. For example, you might be the kind of person who cares little for what others think. If this is the case, the subjective norms would carry little weight in predicting your behaviour' (p. 127).

Both the TRA and TPB are linear additive models that rely upon regression techniques to examine the relationships between variables, and to establish the degree to which these variables can predict behaviour (Chambers *et al., 2007).*

As the TRA only took into account those behaviours under volitional control, Ajzen (1991) added a third component to the model called perceived behavioural control. It was hoped that this would help to explain more variance in intentions and behaviour. The theoretical rationale behind the addition was that, in spite of the presence of both positive attitudes and subjective norm towards a behaviour, individuals might be prevented from carrying it out due to circumstances beyond their control. Perceived

behavioural control, therefore, measures how easy or difficult an individual views their ability to carry out a certain behaviour in relation to their given resources (Ajzen, 1988; 1991).

It has been hypothesised that perceived behavioural control influences behaviour both directly and indirectly. Indirectly, perceived behavioural control may increase or decrease motivation, and therefore, intentions to behave (Abraham & Sheeran, 2003). Directly, perceived behavioural control influences behaviour as events beyond an individual's control may arise after intentions have been formed (Ajzen & Madden, 1986). Evidence suggests that the inclusion of perceived behavioural control much improved the predictive capabilities of the TPB. Van Den Putte (1991) found that perceived behavioural control increased the amount of variance explained by intentions by 14 per cent compared with the TRA model, but by only four per cent for behaviour. These results were supported by Godin & Kok (1996), who found that perceived behavioural control improved the amount of variance the model explained by an average of 13 per cent in relation to intentions, compared with the model containing attitude and subjective norm. In addition, perceived behavioural control increased the amount of variance explained by 12 per cent in relation to behaviour. Figure 1.1 shows a diagram of the TPB.

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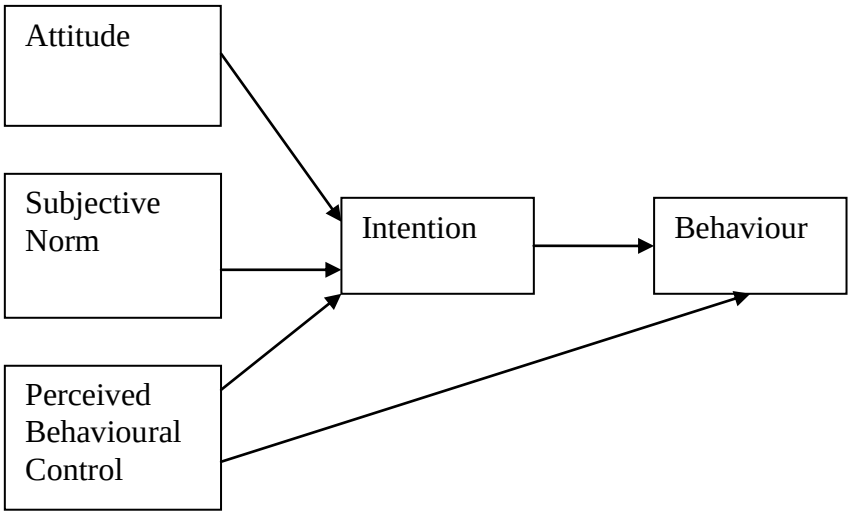

Figure 1.1: Diagrammatic representation of the Theory of Planned Behaviour (Ajzen, 1991).

The TPB is one of the most widely researched theories used in health research. It has been researched and found to be a predictive model in a variety of health related behaviours including giving up smoking (Willemson, 1996), attending health clinics (Norman & Conner, 1996), healthy eating (Chambers *et al.*, 2007) and physical activity specifically (Norman *et al.*, 2000).

There are a number of issues that surround the use of TPB. Armitage and Conner (2001) discuss these in detail in their meta-analysis which examined the efficacy of the TPB. They will be outlined briefly here.

The first issue they refer to is that TPB is a self-report measure and they quote studies that demonstrate data collected in this manner are subject to self-presentational biases (Gaes *et al.*, 1978 cited in Armitage & Conner, 2001). There have been some studies that examine the role of social desirability in the TPB

(Armitage & Conner, 1999; Beck & Ajzen, 1991: cited in Armitage & Conner, 2001) and their results are variable. The study by Beck and Ajzen (1991) found that there was evidence to suggest people answered questionnaires in a socially desirable manner; however, Armitage and Conner (2001) point out that in this study the social desirability measurements were not taken at the same time as the report of behaviour, and that they are also self reported. Armitage and Conner (1999) investigated health-related food choice, social desirability and the TPB. They found that there was no moderating effect of social desirability on the relationships between TPB components.

Armitage and Conner (2001) also discuss the ambiguity of the concept of perceived behavioural control. This is the central component of the TPB as it is what distinguishes it from TRA. Ajzen (1991) argued that perceived behavioural control and self-efficacy were interchangeable, however other authors do not agree. For example, Bandura (1986, 1992: cited in Armitage & Conner, 2001) argued that self-efficacy was more concerned with cognitive perceptions of control on internal control factors and perceived behavioural control was more concerned with external factors. Some authors argue that perceived difficulty is more meaningful to participants and is closer to what Ajzen intended perceived behavioural control to be conceptualized as (Armitage & Conner, 2001).

Intentions are considered a central component in both the TRA and TPB. In this context, intentions are assumed to be how hard people are willing to try, or how much effort they are willing to exert to perform a behaviour (Ajzen, 1991). Armitage and Conner (2001) put forward that researchers do not always use measures that clearly measure a person's intention. Their meta-analysis provided support for there

being a distinction between intention, desire and self-prediction as proposed by Bagozzi (1992). Armitage and Conner (2001) reiterated the argument that subjective norm is the weakest component in the TPB. They state that the most likely explanation for this is that measurement of subjective norm is inaccurate.

The TPB is a well-researched theory that has been shown to explain a significant proportion of the variance in intentions to perform health-related behaviours (Armitage & Conner, 2001; Godin & Kok, 1996). The next section will outline more specifically the research of the TPB in relation to physical activity.

1.9.1 The Theory of Planned Behaviour and Physical Activity

Various studies have been conducted to test the predictive ability of the TPB for exercise intention and exercise participation in order to uncover the underlying factors that determine these behaviours. The research has demonstrated that the TPB generally constitutes a high percentage of variance in relation to intentions to exercise. Blue *et al.* (1995) conducted a literature review that demonstrated that intention to exercise is predicted by between 50 per cent and 70 per cent of the variance and actual exercise behaviour from 40 per cent to 50 per cent. A more recent meta-analysis by Hagger *et al*. (2002) which compared the TRA and TPB in physical activity found that the TRA explained around 37 per cent of the variance in intentions and about 26 per cent of the variance in behaviour. The TPB accounted for 44.5 percent of the variance in intention and over 27 percent of the variance in behaviour. In their meta-analysis, Armitage & Conner (2001) found that TPB usually accounts for about 31 per cent of the variance in health-related behaviour.

Blue *et al*. (2001) found similar results using structural equation modeling. Their results showed that the participants' attitude towards exercise and perceived behavioural control were significant predictors of intention to exercise, accounting for 61.7 per cent of the variance. Furthermore, intention and perceived behavioural control explained 51.3 per cent of the variance of actual exercise behaviour. In this study, subjective norm was not found to be a significant predictor of exercise intention: instead, attitude was found to be the most important. These results suggest that the individuals who had the strongest intentions to exercise had a more positive attitude to exercise than those who had weaker intentions. The lack of influence of subjective norms on either exercise intention may be explained by the participants' beliefs that partaking in exercise is one's own responsibility and not a behaviour that has the potential to affect those who are important (Rutter & Bunce, 1989). It is also possible that this variable is not applicable for this population.

In a similar way to research in other health behaviours, the perceived behavioural control component is considered vital when utilising the TPB. Several studies compare the use of the theory of reasoned action and the TPB in terms of predicting intentions to exercise and actual exercise (Blue, 1995; Kimieck, 1992; Norman *et al.*, 2010). These studies highlight the importance of the perceived behavioural control component in predicting exercise behaviour. It is thought that perceived behavioural control could explain between four per cent and 20 per cent of the variance in exercise intention (Godin, 1993).

The direct influence of the perceived behavioural control component has also been accentuated by research findings that show it is predictive for exercise and for distance walked, even when intention was not a reliable predictor of these health

behaviours (Johnston *et al*., 2004). However, this study involved participants with coronary heart disease (CHD), which may suggest that the perceived behavioural control component is most predictive in a group with high motivation to perform the behaviour.

Other research that has assessed the ability of the perceived behavioural control components has found perceived behavioural control to be particularly predictive of exercise. The study in question showed that perceived behavioural control was able to explain an additional nine per cent in intention to exercise and only two per cent for healthy eating intention over and above the theory of reasoned action (Payne *et al*., 2004). This study did not include predictions of actual behaviour but it nonetheless highlights the usefulness of perceived behavioural control, particularly in intention to exercise.

In a study that included actual exercise behaviour, Hausenblas *et al.* (1997) found that the model significantly predicted exercise behaviour. They also found that attitude had a direct influence. A similar result was reported in a study by Bentlar and Speckart (1981), where attitude was found to be a more influential predictor of exercise behaviour than was intention.

The studies identified suggest that the TPB is an effective model for predicting exercise behaviour. Attitude and perceived behavioural control are thought to be the most predictive variables in forming intentions to take part in physical activity. The next section will briefly outline the use of the TPB in changing behaviour.

1.9.2 Changing health related behaviours using the TPB

As outlined in the previous sections, most of the research concerns predicting and explaining behaviour. However, the TPB has also been used to design behavioural interventions (Hardemen *et al*., 2002). Parker and colleagues (1995) used existing TPB research to identify beliefs and values that predict intention to commit driving offences, such as speeding. They found some changes in attitude as measured by the TPB. However, there was no significant change on a measure of intention to speed. The authors concluded that this might reflect the brevity of the intervention and resistance to change of certain behaviours.

Other intervention studies show a more positive result. Brubaker and Fowler (1990) evaluated an intervention to encourage men to perform testicular self-examination. One group of participants were exposed to a tape recorded message designed to change their beliefs about doing this self-examination, another group were exposed to more general information about cancer and a third group received no information. About four weeks later, all participants completed a TPB questionnaire and 71 per cent of those in the theory based intervention group had self-examined as opposed to 44 per cent in the second group who received more general information. Only 19 per cent of those people in the third group completed a self-examination.

A strength of using the TPB as a basis for designing interventions is that it should allow tailored interventions that are designed to address the beliefs that differ significantly between those who intend to do a behaviour and those who do not. Ajzen and Manstead (2007) argue that it does not make psychological or economical sense to focus on beliefs that are held equally by those who intend to perform a behaviour and those who do not. An example based on the research of Armitage and

Conner (1999) is outlined here. They found that both intenders and non-intenders felt that a low-fat diet reduces the risk of heart disease. However, they found differences between intenders and non-intenders on beliefs such as eating a low-fat diet makes you feel good, eating a low-fat diet helps you to control your weight and eating a low-fat diet need not lead to boring food. Therefore, it would be more effective to focus interventions on these types of beliefs.

A difficulty with using the TPB for guiding interventions is that it is not clear how beliefs should be changed. However, the model was not formulated as a theory of belief change. One potentially helpful technique for assisting people to act on intentions is the use of implementation intentions (Gollwitzer, 1999). These differ from intentions in that they specify where and when the behaviour in question will take place. There is some evidence that implementation intentions may be helpful in changing physical activity behaviour. Armitage and Sprigg (2010) found that implementation intentions significantly increased physical activity in children from lower socioeconomic backgrounds. The benefit of implementation has been found in other health-related behaviours. In a study by Orbell *et al.* (1997), it was found that women who wrote down where and when they would undertake breast self-examinations were much more likely (64 per cent) to perform this behaviour than those who were in the control group (14 per cent). This may link with care-planning for adults with a learning disability.

1.9.3 Using the Theory of planned behaviour in other populations

There have been studies that use the TPB as a model to predict the behavioural intentions of one group of people towards another. These studies have mainly focused on parental intention to support their child in engaging in a certain behaviour. One study examines the role carers and parents have in relation to people with a learning disability. The studies that were identified are outlined in Table 1.2 and are discussed in this section.

Table 1.2: Table to show outline of research relating to the TPB in other populations

Author	**Sample**	**Dependent Variable**	**Most predictive variables in order (most predictive first)**
Andrews *et al.* (2010)	201 mothers of young children aged between 2 and 5 years	Parental report of monitoring child's eating	Attitude* Subjective Norm* Perceived Behavioural Control*
Astrom & Kiwaunka (2006)	589 child-caregiver dyads	Intention to control a child's intake of sugared snacks	Attitude* Subjective Norm* Perceived Behavioural Control*
Brachitta (2006)	151 parents of children between the ages of 4 and 8	Parental report of the use of a car booster seat	Attitude* Perceived Behavioural Control Subjective Norm
Chambers *et al.* (2007)	250 parents of children under the age of 16	Parental intention to support child to have a healthy diet	Attitude* Perceived Behavioural Control* Subjective Norm*
Hounsa *et al.* (1993)	128 mothers with a child under the age of one	Mothers' intention to use oral rehydration sachets	Attitude* Perceived Behavioural Control* Subjective Norm
Jenkins & McKenzie (2010)	112 paid care staff of adults with a learning disability	Carer intention to support person with a learning disability to have a healthy diet	Subjective Norm* Attitude* Perceived Behavioural Control*

*variable significant at $p<0.05$

Andrews *et al.* (2010) conducted a study in which parents completed a TPB questionnaire relating to the provision of providing healthy foods and limiting unhealthy foods for their children. The results supported the use of the TPB as being predictive as a model for this population. The strengths of this study include a large sample size, and good construct validity for the TPB variables. The limitations of the study include, as with many TPB studies, the fact that it uses a self-report measure of behaviour. However, it is a recent example of an application of TPB that adds to the evidence base that the TPB can be used as model for predicting the intentions of one group of people in relation to another.

Chambers *et al.* (2007) examined both the intention of adults to eat healthily and the intentions of parents to ensure their children ate a healthy diet. They found that the TPB was a predictive model of intention to eat healthily over the next year in a large sample of adults in the UK. In addition, they found that the theory of planned behaviour was predictive of parents' intention to support their children to eat healthily over the next year. This study only measured intention and not behaviour, which is a potential weakness. In addition, the inclusion criteria were that the participant is a parent of a child under 16. Older children may have more control than their parents over some aspects of their diet – or parents may not be aware of their behaviour when they are not with them.

Barchitta (2006) used the TPB to predict the use of booster seats in cars by parents. They used a self-reported measure of booster seat use as the outcome variable and they used a TPB questionnaire that was specifically designed and piloted for the project. They found that using the TPB as a model to predict parents' intention to use

a booster seat explained 67 per cent of the variance. However, intention was only significantly predicted by attitude towards booster seats and not by the other variables of subjective norm and perceived behavioural control. The authors note that the majority of the respondents were from a high socio-economic status that may not be representative of the population the sample was taken from. They also discuss the limitations of using self-report measures.

Astrom and Kiwaunka (2006) examined the intention of carers in Uganda to control preschool children's snacking habits. This paper found that 13 per cent of the variance was explained by the TPB. This was a large-scale study and it is one of the few published studies to a non-western sample. The results of this study may have been affected as the questionnaire was administered by an interviewer and this may have increased the likelihood of people responding in a socially desirable manner. The interview took place in English for the majority of the participants, but for some it had to be translated to Luganda (the local language). This translation may have had an impact on the understanding of the questions.

A study by Hounsa *et al.* (1993) used the TPB to predict the intention of mothers to use oral rehydration therapy in West Africa. This study found the TPB variables to explain 40 per cent of the variance in mother's intention to use oral rehydration therapy. The study was carried out with illiterate mothers, and may have similar difficulties, such as people answering in socially desirable manner, to the aforementioned study by Astrom and Kiwanka (2006).

Jenkins and McKenzie (2010) examined the role of the TPB to predict the intentions of care staff to support people with a learning disability to partake in health eating. This research indicated that the TPB was an applicable model in this setting. All

three variables that make up the original model of the TPB: attitude, subjective norm and perceived behavioural control were found to be statistically significant predictors, accounting for 31 per cent of the variance. The authors also tested the hypothesis that an extended model of the TPB, which included self-efficacy and self-identity, would be more predictive. This hypothesis was partially substantiated; the overall predictive power of the model was marginally higher and accounted for 35 per cent of variance. However, only attitude and subjective norms were found to be significant predictors of the carers' intention to encourage healthy eating in adults with learning disabilities, while the variables of self-efficacy and self-identity were not significant.

This section has highlighted that the predictive validity when using the TPB as a 'proxy' can vary. The lowest reported explained variance for the studies was 13 per cent in the intention of Ugandan parents to control their child's intake of sugared snacks (Astrom & Kiwaunka, 2006). This highest explained variance was that of parents' intentions to use a booster seat, which was 67 per cent (Barchitta, 2006).

It can be concluded from the data outlined in Table 1.2 that attitude most often explains the majority of the variance in intentions. Interestingly, the only study that uses paid care staff suggests that subjective norm explains the majority of the variance.

In summary, there is a growing evidence base that TPB can be used to predict the behavioural intentions of one group of people towards another. The majority of this research has taken place with parents and children. A recent study by Jenkins and McKenzie (2010) has utilised the TPB as a model to predict carers' intentions in

relation to people with a learning disability and healthy diet. It is hoped that the present study will continue to add to this evidence base.

1.10 The Present Study

The discussion in the introduction shows that there are significant health-related benefits to taking part in physical activity, both for the general population and for people with a learning disability. As many people with a learning disability share their decision making with their carers, it is important to consider the role of carers when thinking about future interventions. The primary aim of this project was to investigate whether the TPB is a predictive model of carers' intentions to support physical activity behaviour and actual physical activity behaviour in individuals with a learning disability.

1.10.1 Hypotheses

Hypothesis 1: Past physical activity behaviour and follow-up physical activity behaviour as measured by the IPAQ-SF will correlate with each other and with intention.

Hypothesis 2: Carers' intentions to support physical activity behaviour in clients with a learning disability will be predicted by carers' attitudes, subjective norms and perceived behavioural control.

Hypothesis 3: Physical activity behaviour of individuals with a learning disability will be predicted by both carers' intentions to support this behaviour and their perceived behavioural control of this behaviour.

Hypothesis 4: Attitude will be the strongest predictor of carers' intention to support clients with a learning disability to participate in physical activity.

2 Method

2.1 Overview

The background to the current study and research questions was presented in the previous section. This section aims to describe the methodology of the research. It will cover the design of the study, ethical considerations and participants' characteristics. It will then detail the measures selected, including the process of adaptation for use with this population. This section will also describe the procedure through which the data were collected and analysed.

Due to a limited response rate in the initial data collection, a second round of data collection was undertaken. The methodology for each phase of data collection is outlined separately in this section.

2.2 Ethics

The University of Edinburgh Clinical Psychology Ethics Committee reviewed the study, and it indicated that it was viable and that there were no major ethical issues. The committee recommended that the researcher contact the local NHS ethics committee in order to ensure it did not require NHS ethical approval. Copies of the thesis proposal form (Appendix 1), the questionnaires and the participant information (Appendix 4) were emailed to the local NHS ethics committee which confirmed that it did not require that the project be submitted for full ethical approval. (Appendix 2).

2.2.1 Ethical Considerations

The ethics of the present study were considered carefully prior to the review by the University. Two potential ethical issues were apparent: the first would arise if there were any questionnaire responses that gave rise to concern about the care of a person

with a learning disability. In order to address this it was planned that a summary of the results from the study would be disseminated to all agencies who participated to let carers know how much physical activity was being done and what predicted this. This study may be able to help inform future research that could then address this issue in more detail. The second issue was that carers might view the questions about their attitudes toward exercise as intrusive. This concern was alleviated as the reasoning behind the study was clearly outlined in the participant information sheet.

2.3 Power calculation and Sample Size

Cohen (1988) stated that as a rule of thumb, most effect sizes from psychological research are medium. A review indicated that most studies using the Theory of Planned Behaviour (TPB) regardless of the behaviour have a medium to large effect size (Armitage & Conner, 2001). The present study was expected to have a medium effect size. In order to detect a medium effect size, with a power level of 0.8 for a regression analysis with three predictors, it was estimated that 76 participants would be required.

A post hoc power calculation was undertaken using G*Power (Erdfelder *et al.,* 1996). Assuming a medium effect size (0.3), with 78 participants, and three predictor variables the achieved power was 0.99.

2.4 Design

A cross-sectional, quantitative design was employed to address the research questions outlined. An initial battery of three measures was administered to all participants (Time one). In addition, all participants were asked to complete a follow-up measure of their clients' physical activity behaviour (Time two).

2.5 Participants

Data were collected from participants in two ways which will be outlined in the following sections. Potential participants were given the following inclusion and exclusion criteria.

2.5.1 Inclusion Criteria

1) The participant must support a person with a learning disability living either on their own or in a shared home with other people with physical or learning disabilities.

2) The participant must be the main keyworker for a person with an intellectual disability and the person they support should have a degree of choice over their activities

2.5.2 Exclusion Criteria

1. The participant supports the person with an intellectual disability who resides in a hospital. This is because people who reside in hospital are less likely to have control over their activities.

2. There is more than one agency involved in the individual's care. This was to avoid crossover between the charitable/voluntary organisations already involved in the research study and to keep data independent.

2.5.3 Eligible Organisations:

In total, 15 separate care organisations were approached to take part in the study. Seven of these participated. All of the agencies that were approached currently provided residential care to adult with disabilities. The service characteristics of both

those who took part and those who did not take part are outlined in table 2.1. The names of the agencies have not been included in order to protect their anonymity.

Table 2.1: Table to outline service characteristics of agencies that were approached to take part in the research project

	Took part in study:	**Number of residents supported within Forth Valley**	**Number of staff employed within Forth Valley**	**Is the provider:**	**Input from LD Psychology:**	**Provides support to:**
Agency 1	No	33	105	Rural	Current Previous	LD
Agency 2	Yes	56	145	Urban	Current Previous	LD
Agency 3	No	13	32	Both	Never	Mental Health LD
Agency 4	Yes	13	35	Urban	Current Previous	Mental Health LD
Agency 5	Yes	15	30	Urban	Current	Older Adult LD
Agency 6	Yes	53	212	Both	Current Previous	LD
Agency 7	No	37	92	Both	Current Previous	LD

Agency 8	No	30	Information not available	Both	Previous	LD
Agency 9	No	23	74	Urban	Never	LD Mental Health
Agency 10	Yes	54	130	Both	Current Previous	Autism LD
Agency 11	No	72	Over 200	Both	Never	LD Mental Health
Agency 12	Yes	35	87	Rural	Current Previous	LD
Agency 13	Yes	17	58	Urban	Never	Older Adult LD
Agency 14	No	12	36	Both	Current Previous	LD
Agency 15	No	15	60	Urban	Never	Mental Health*

*the agency was not providing a service to adults with a learning disability at the time of the study.

The information about service characteristics were gathered from several sources, including the websites of the agencies, and telephone conversations with the administrative staff.

2.5.4 Demographic Data of Participants

Seventy-eight people completed the time one questionnaires, 57 (73.1 per cent) of the respondents were female and 21 (26.9 per cent) were male. The time two questionnaire was completed by 28 (35.9 per cent) of the respondents.

The participants supported 28 (35.9 per cent) female clients and 50 (64.1 per cent) male clients. The breakdown of the male and female clients and the gender of carer who supports them is shown in the Table 2.2. This information is from the overall sample and is not split into time one and two.

Table 2.2: Table to show gender of staff against gender of client

		Client Gender		
		Female (per cent)	Male (per cent)	Total (per cent)
Care Staff Gender	Female (per cent)	25 (32)	32 (41)	57 (73)
	Male (per cent)	3 (4)	18 (23)	21 (27)
	Total (per cent)	28 (36)	50 (64)	78 (100)

Individuals were not asked to state their age, but were instead asked to tick a box with a corresponding age range. This is consistent with previous research regarding the TPB (Smyth, 2009). The age ranges of the carers who completed the questionnaires are shown in Table 2.3.

Table 2.3: Table to show the age categories of the carer respondents to the questionnaire

Age Category	Number in Sample	Percentage (per cent)
18 – 24	9	11.5
25 – 34	21	26.9
35 – 44	19	24.4
45 – 54	23	29.5
55 – 64	6	7.7
65+	0	0.0

As shown in the table, the highest proportion of carers was in the age category of 45 – 54 years old. In this sample, there were no carers over the age of 65.

Table 2.4 shows the ages of the clients to whom these questionnaires relate.

Table 2.4: Table to show the age categories of the clients

Age Category	Number in Sample	Percentage (per cent)
18 – 25	18	23.1
25 – 34	17	21.8
35 – 44	16	20.5
45 – 54	17	21.8
55 - 64	7	9.0
65+	3	3.8

Table 2.4 shows an even spread of clients, up until the age category of 55 – 64, they became fewer. However, there were people represented from the client group that are over the age of 55, including three people over the age of 65.

The number of hours in which individual staff support client each week ranged from one to 44, with a mean of 26.24 (standard deviation: 27.02). The number of hours that the organisation supported the individual ranged from one to 168 (full-time) with a mean of 118.88 (standard deviation: 68.22).

The percentage support that the client received from the carer ranged from 1.79 per cent to 100 per cent of the total care the client received with a mean of 29.92 (standard deviation: 26.91).

2.6 Measures

Data were collected using three questionnaires: two of the questionnaires were designed to measure the TPB and one questionnaire measured exercise behaviour. The adaptation of the Norman and Connor (2005) questionnaire is reported this research. This was because this questionnaire measures the more general concepts of the TPB. In addition, this questionnaire has been well validated through use in previous research about the TPB and physical activity. The second TPB questionnaire was adapted by the author from previously used questionnaires (Smyth, 2009; Chambers, 2008) regarding the TPB and diet. The information regarding the results of the second questionnaire is available in Appendix 10 and it is intended that it will be written up as a separate study. The questionnaires used in thesis are outlined below.

2.6.1 The Norman & Conner (2005) Theory of Planned Behaviour Questionnaire

Norman and Conner (2005) designed this questionnaire in line with Ajzen's (1988) recommendations (as cited in: Francis *et al.,* 2004). These recommendations suggest

that the construction of a theory of planned behaviour questionnaire involves nine steps. These steps are to:

1. Define the population of interest.
2. Define the behaviour that is to be studied.
3. Decide how to measure intentions.
4. Determine the most frequently perceived advantages and disadvantages of performing the behaviour.
5. Determine the most important people or groups of people who would approve or disapprove of the behaviour.
6. Determine the perceived barriers or facilitating factors which could make it easier or more difficult to adopt the behaviour.
7. Include items to measure all of these constructs in the first draft of the questionnaire.
8. Pilot the draft and reword items if necessary.
9. Assess the test-retest reliability of the measures by administering the questionnaire twice to the same group of people, with an interval of at least two weeks.

This questionnaire used a Likert scale from -3 to +3 for all questions. The composite variable score was a mean of the individual scores relating to that factor. A high score in intention meant the participant had a higher intention of taking part in physical activity. A high score in attitude meant the participant had a more positive attitude towards physical activity. A high score in subjective norm suggested the

participant was more influenced by those important to them. A high score in perceived behavioural control meant that the participant felt that had more control. This questionnaire was used by Norman and Connor (2005) and in their study the TPB variables were found to have the following Cronbach's alpha scores: a person's attitude towards taking regular physical activity over the next six months was measured using five differential scales (e.g. bad – good, harmful - beneficial) and found to have a Cronbach's alpha of 0.73; subjective norm was measured using three items and was found to have a Cronbach's alpha of 0.84; perceived behavioural control was measured using five items and the Cronbach's alpha was 0.89; behavioural intention was measured using three items and had a Cronbach's alpha of 0.95.

2.6.2 The International Physical Activity Questionnaire – Short Form (Booth, 1996) (IPAQ-SF)

The IPAQ is an international measure for physical activity, it has both a long form (IPAQ) and a short form (IPAQ-SF). Both the IPAQ and the IPAQ-SF have had extensive reliability and validity testing across 12 countries (14 sites). Reliability scores of the IPAQ-SF have been calculated using the Spearman's *rho,* and are reported to be to be between 0.61 and 0.83 (Craig *et al.*, 2003). These results suggest the IPAQ-SF has acceptable properties for use in many settings and in different languages. The IPAQ-SF allows the measurement of exercise in metabolic equivalent of tasks (MET). This is a physiological concept expressing the energy cost of physical activity (Ainsworth *et al.*, 1993). The IPAQ-SF was used to calculate a total met/minute score for a week using formulae outlined in Ainsworth *et al.* (1993). These formulae are as follows:

Walking MET-minutes/week

= 3.3 * walking minutes * walking days

Moderate MET-minutes/week

= 4.0 * moderate-intensity activity minutes * moderate days

Vigorous MET-minutes/week

= 8.0 * vigorous-intensity activity minutes * vigorous-intensity days

Total physical activity MET-minutes/week

= sum of Walking + Moderate + Vigorous METminutes/week scores.

2.6.3 Adaptation of the Questionnaires

The author obtained permission from the authors of the original questionnaires for use with carers of adults with a learning disability.

2.6.3.1 The Norman & Conner (2005) Theory of Planned Behaviour Questionnaire

This questionnaire was designed specifically for measuring the constructs of the TPB in relation to exercise. The questions were adapted for use in this study. In the adaptation the word 'you' was changed for the concept of supporting a client to exercise. For example, "How likely is it that you will exercise at least three times over the next week?" was altered to read "How likely is it that you will support your client to exercise at least three times over the next week?" After the data were collected, Cronbach's alpha were calculated for each of the TPB variables, and were as follows: attitude had a Cronbach's alpha of 0.75; subjective norm had a

Cronbach's alpha of 0.54; perceived behavioural control had a Cronbach's alpha of 0.84; and intention had a Cronbach's alpha of 0.71. Scores above 0.7 are generally accepted as indicating good reliability (Field, 2005).

2.6.3.2 The International Physical Activity Questionnaire – Short Form

The wording in this questionnaire was altered so it referred to the client rather than the respondent. For example, "On how many days do you do vigorous exercise a week?" was altered to read, "On how many days does your client do vigorous exercise in a week?"

2.7 Phase 1: Paper data collection

2.7.1 Participants

All participants whose data were collected with the paper questionnaires were individuals who worked as keyworkers with adults with learning disabilities in voluntary and charitable organisations within the Forth valley region of Scotland. The total number of respondents in this phase of data collection was 35. Of this 35, 28 (80 per cent) were female and seven (20 per cent) were male. The initial data collection using the paper questionnaires resulted in 35 questionnaires being returned. The researcher distributed 210 questionnaires so this represents a response rate of 17 per cent. The data collected from this phase represent 44.9 per cent of the total sample used in the study. The initial questionnaires were either returned anonymously by being left in a locally placed sealed collection box that was to be collected by the author on a specified date. Alternatively, they were returned by mail and 27 (77 per cent) people returned them in this manner. The second questionnaire, the follow-up IPAQ-SF, was returned in a pre-printed and paid envelope two weeks

following the initial questionnaire and 13 (37 per cent) of the people recruited using this method returned this questionnaire. Both questionnaires asked that the respondent record the day of the month that they were born and the first two letters of their mother's first name. This allowed the follow-up questionnaires to be matched with the initial questionniares. It could have also acted as a unique identifier if a participant wished to withdraw from the research.

2.7.2 Procedure

Suitable care agencies were initially identified through the local Learning Disability Psychology Department. The local Community Learning Disability Teams (CLDTs) were also contacted and the research project was discussed at their monthly team meetings. From the discussions following these presentations, particular contacts and care organisations were recommended. The local telephone directory was also used to identify voluntary/charitable organisations in the local area, and the local council web pages for information about voluntary/charitable organisations that provide residential care to adults with learning disabilities.

The head office of each agency identified was written to with a brief outline of the project (Appendix 3). This letter was followed up by a phone call two to three weeks after the letter had been sent, to discuss the project further and to ascertain whether the care agency would be willing to allow their staff to participate. During this phone call, it was explained that the research was a part requirement of the Doctorate in Clinical Psychology (D.Clin.Psychol.) training. An outline of the procedure, including the rationale for the project, the inclusion and exclusion criteria, confidentiality and anonymity was given and any questions that were asked were addressed. It was also agreed that the results would be disseminated upon completion

of the research. The researcher and the agency then agreed on methodologies for the delivery, distribution and collection of the questionnaires.

All of the agencies that took part in the research requested that the questionnaires be delivered to the agency head office, and they would arrange their distribution. Two agencies requested that the questionnaires be collected from the office on a predetermined date. The remaining agencies requested stamped addressed envelopes in order to allow their staff to return the questionnaires.

Each questionnaire pack contained the two TPB questionnaires and IPAQ-SF (Appendix 4). It also contained a second copy of the IPAQ-SF with instructions for this questionnaire to be returned two weeks later in order to measure actual behaviour. The pack also contained information sheets about the study and consent forms. The information sheet outlined the purpose of the study and made sure that participants were aware the study was entirely anonymous and voluntary. The researcher's contact details were also given, in case of any questions or difficulties. All questionnaire packs also contained two stamped addressed envelopes, one for the initial questionnaires, and one for the follow-up measure of exercise behaviour.

Care staff from the first agency who became involved were given a feedback sheet (Appendix 5) adapted from manual for health services researchers about using the TPB in research (Francis *et al.*, 2004). These staff members were asked to complete the questionnaires and to provide feedback about them on this sheet. Ten questionnaires were distributed with this sheet attached as outlined in the procedure above. Four support staff returned these questionnaires. These four questionnaires contained no missing data. The participants' feedback indicated that the questionnaires were readable, and that they understood what was asked of them. Two

staff members indicated that they felt the questionnaires were repetitive. However, as the data collection involved two questionnaires that measured the TPB it was felt that this was inevitable. Therefore, no changes were made to the questionnaires. If any issues had been highlighted at this point, any necessary amendments would have been made prior to distributing the remaining questionnaires.

The agencies that had agreed to take part and had questionnaires distributed were phoned again after one month. This amount of time was chosen in order to allow time for the head offices to distribute the questionnaires, and for the staff to complete them. The reason for this call was to ask them to remind staff about the study and to ensure there were no difficulties in completing the questionnaire.

2.8 Phase 1: Online data collection

Due to the limited response rate to the paper questionnaires, a second round of data collection was undertaken using an internet based data collection method (Bristol Online Survey). The procedure for this is outlined below.

2.8.1 Participants

All participants in this study were individuals who worked as keyworkers with adults with learning disabilities with the United Kingdom. Potential participants were made aware of the inclusion and exclusion criteria in the initial post. These criteria were the same as outlined in phase 1.

Using the online questionnaires, 43 (55.1 per cent) responses were collected. Of these, 29 (67.4 per cent) were female and 14 (32.6 per cent) were male. From this group, 15 (34.8 per cent) people completed the follow up questionnaire.

2.8.2 Measures

The questionnaires were identical in content to those outlined in phase 1. The questionnaire structure was also adhered to in the online version.

2.8.3 Procedure

Prior to the commencement of this method of data collection, guidance was sought from supervisors and the university ethics tutor. An addendum to the original ethical approval form was submitted to the university (Appendix 6). The questionnaires were published online using the Bristol Online Survey, a tool provided by the University of Edinburgh. The links to these questionnaires were posted on two internet forums:

1. LD Choice Network (http://www.ldhealthnetwork.org.uk) which is open to professionals, families and care staff of people with learning disabilities
2. ClinPsy (http://www.clinpsy.org.uk) which is a website for aspiring clinical psychologists and has many members who work as support workers.

The post inviting people to participate (Appendix 7) incorporated the inclusion and exclusion criteria and a link which brought people to the initial questionnaire pack (including the participant information sheet) as outlined in phase 1. There was a separate link in this post for the follow-up questionnaire.

A month after the initial post, a reminder was posted on the website (Appendix 8). This was both to remind readers of the forum about the study, and also to remind people who had completed the first part of the study to fill in the follow up questionnaire.

3 Results

3.1 Overview

The methodology of the current study, and the process used for adapting the questionnaire were outlined in the previous section. The current section will present the findings from the research. A summary of the variables will be presented. Then correlations between the relevant variables will be examined. Finally, path analysis was used to assess the applicability of this model in this population.

3.2 Data Analysis

Data from the paper and the online questionnaires were collated into a Predictive Analytic Software 17 (PASW 17) file. The data were examined and there were no significant differences in the amount of exercise or the TPB variables dependent on the method of data collection.

3.2.1 The handling and coding of data

There were no missing data from the online questionnaires as the design of questionnaires meant it was not possible to submit them unless all questions had been completed. When inputting the data from the paper questionnaires into the database, there were some questionnaires that were completed incorrectly. The ambiguous answers were coded as outlined below:

1) On one questionnaire, the respondent indicated that they themselves, and not the organisation, cared for their client 168 hours a week. This questionnaire was excluded from the analysis.

2) On one questionnaire, the respondent indicated their organisation cared for the client 210 hours per week. It was assumed that the respondent meant the maximum number of hours which is 168 and the questionnaire was coded as such

Part four of the questionnaire asked respondents about their age, gender and hours worked and the age and gender of the person who they are answering the questionnaires in relation to. In addition, question eight of section four asked respondents to indicate if there were any other factors that they thought would influence the amount of exercise that their client did. The author looked for patterns in these answers and found six main themes. These were obesity, mobility problems, medical conditions, challenging behaviour and sensory impairments and none. These were rated independently by a colleague of the author.

Separate variables were computed using PASW 17 for each of the TPB variables. These were calculated by obtaining the mean of the questions relating to that variable.

The information about physical activity behaviour was collected for past behaviour and at a two-week follow up time. The low response rate to the follow-up questionnaire meant there were insufficient data to use the follow-up questionnaire for the path analysis. However, the original TPB questionnaires do not use behaviour in the model (Ajzen, 1991). Past behaviour correlated highly with the follow-up questionnaires that were returned, and Ajzen (1991) suggests that past behaviour can be used in TPB. Therefore, past behaviour was included in the path analysis.

3.2.2 Preliminary Analysis

Preliminary analyses were carried out to evaluate the data against the assumptions of normality. Normality of the variables was assessed through examination of the histograms, and using the Kolmogorov-Smirnov test. Results from the Kolmogorov-Smirnov test indicated that the outcome variable (past behaviour) and two of the predictor variables (attitude and subjective norm) were not normally distributed. However, Field (2005) suggests that significance on this test does not necessarily indicate whether this deviation from normality is large enough to bias statistical analysis. Therefore, data were further analysed by assessing the skew and kurtosis present. Field (2005) suggests that z-scores greater than 2.58 for both skewness and kurtosis should be considered significant at $p < 0.01$. Analysis of the data using this method revealed that significant kurtosis was not present in any variables in this study, however, the outcome variable (past behaviour) was found to have significant positive skewness ($z=9.75$, $p<0.01$) and one of the predictor variables (SN) was found to have significant negative skewness ($z=-4.01$, $p<0.01$).

3.2.3 Data transformations

Data transformations are recommended in cases where the assumption of normality is violated (Tabachnick & Fidell, 2001). The aim of data transformation is to reduce the impact of extreme scores, whilst preserving the relationships between them. Relationships between scores are not altered as a result of data transformation, as the same transformation is carried out on each of the values within a variable (Field, 2005).

A logarithmic transformation on past behaviour resulted in the most improvement in normality, although it did not result in non-significance on the Kolmogrov-Simirnov test ($p < 0.05$). The transformed data was still significant for skewness ($z=-5.98$, $p<0.01$). However, from the histograms this is the closest to normal distribution and was therefore used in the analysis. A transformation which involved raising the exponential e, which is a constant number of approximately 2.718 (Clark-Carter, 2010), to the power of each data point in subjective norm resulted in the most improvement in normality. It did not result in non-significance on the Kolmogorov-Smirnov test. However, the transformation did result in both non-significant skewness and kurtosis ($p>0.01$).

3.3 Statistical Analysis

The following section outlines the statistical analysis of the data.

The data relating to the theory of planned behaviour were examined using independent samples t-tests in order to check if there were any differences between the data that were collected using paper-and-pencil and those that were collected using the online questionnaires.

Pearson product-moment correlations were used to assess the correlations of the transformed TPB variables on the outcome variables (intention, past behaviour and follow-up behaviour).

Path analysis was carried out using an add-on to PASW 17, Analysis of Moment Structures (AMOS). When using AMOS for path analysis a model is drawn that

shows the exogenous and endogenous variables and the expected paths and co-variances. The programme runs the model using the variables specified and the output includes the path diagram with the standardised coefficients. In addition to the standardised coefficients AMOS also produces text output (Appendix 9), which gives a number of indices that can be used to assess the "goodness-of-fit" of the model. The data were also examined using EQS (Bentler, 1995) and multiple regressions in PASW 17 and the results were identical.

In order to assess the fit of the data to the model and the variance explained the B coefficients, the standardised β and the p-values were recorded and examined. The squared multiple correlation was used to estimate the amount of variance explained by the model. When the data were run using multiple regressions they were checked to ensure no multicollinearity by checking that the tolerances and variance inflation factors (VIF). If there is no multicollinearity the tolerances should be above 0.2, and VIFs should be below 2.

3.4 Descriptive Data

3.4.1 Levels of Physical Activity

The summary Table 3.1 shows the median, interquartile range and the range of MET minutes/week as measured by IPAQ-SF. These scores are for walking, moderate activities, vigorous activities and total physical activity.

Table 3.1: Table to show median, interquartile range, full range of MET-Minute/week for physical activity, number of sample who took part and percentage

Activity	Median	Interquartile Range	Range	Number of people	Percentage
Walking	313	561	0 – 13860	70	89.7
Moderate	240	720	0 – 6720	22	28.2
Vigorous	0	540	0 – 7680	2	2.6
Total	1066	1670.25	0 – 13860		

Examination of the responses to the IPAQ-SF allowed the researcher to identify if the adult with a learning disability on behalf of whom the participant answered the questionnaire met the minimum recommended levels of physical activity.

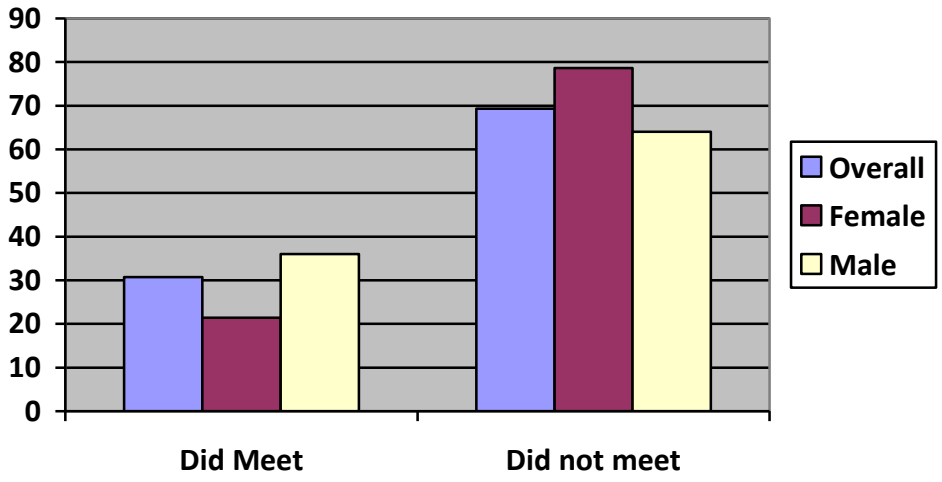

Figure 3.1: Percentage of people with a learning disability who meet minimum physical activity guidelines for health

3.5 Factors which may influence physical activity

The responses from the questionnaires indicated that 37 (47.4 per cent) of the clients had no identified factors that would influence their levels of physical activity. The distribution of the remaining 41 (52.6 per cent) is shown in Table 3.2. No

respondents mentioned any positive factors such as the person with whom they work being a special Olympian.

Table 3.2: Table to show factors that may influence the physical activity a person can take part in

Factor	Number of People	Percentage of total sample
None	37	47.4
Obesity	7	9.0
Mobility Problems	16	20.5
Medical Conditions	10	12.8
Challenging Behaviour	2	2.6
Sensory Impairment	6	7.7

3.6 The Theory of Planned Behaviour variables

The theory of planned behaviour variables were examined using independent samples t-tests in order to ascertain if there were any differences in these data which may be attributable to the method of data collection (paper-and-pencil or online). The results of these t-tests were all non-significant. There was not a significant difference between the paper-and-pencil and online conditions for attitude; $t(76) = 1.240$, $p = 0.219$. There was not a significant difference between the paper-and-pencil and online conditions for subjective norm; $t(76) = 0.519$, $p = 0.605$ There was not a significant difference between the paper-and-pencil and online conditions for perceived behavioural control; $t(76) = 0.252$, $p = 0.802$. There was not a significant difference between the paper-and-pencil and online conditions for intention; $t(76) = 1.344$, $p = 0.674$.

Table 3.3 shows the mean, standard deviation and ranges for the variables measured by the TPB questionnaire.

Table 3.3: Summary of descriptives for the theory of planned behaviour variables

Questionnaire	**Variable**	**Mean (Standard Deviation)**	**Range**	**Positive Responses (%)**
Theory of Planned Behaviour Questionnaire Norman & Conner (2005)	Intention (INT)	0.49 (1.69)	-3 – 3	38.5
	Attitude (ATT)	1.99 (1.06)	-1 – 3	84.6
	Subjective Norm (SN)	0.68 (1.29)	-2 – 3	60.3
	Perceived Behavioural Control (PBC)	-0.48 (1.59)	-3 – 3	21.8

In addition, past physical activity behaviour and follow-up physical activity behaviour were measured using the IPAQ-SF. The IPAQ-SF recommends using the median and interquartile range when reporting the results as it tends not to be normally distributed. These variables are shown in Table 3.4.

Table 3.4: Summary of IPAQ-SF

Questionnaire	**Variable**	**Median (interquartile range)**	**Range**
IPAQ-SF	Past Behaviour	1066 (1670.25)	0 – 13860
	Follow up Behaviour	861.75 (1535)	0 – 10670

3.7 Bivariate Correlations

A correlation matrix was made using Pearson product-moment correlation to show the relationships between the TPB measures and past and follow-up physical activity. As outlined previously, in these and all further statistical analyses the transformed versions of variables will be used.

Table 3.5: Table to show correlations of the TPB variables and those of physical activity behaviour

		Theory of Planned Behaviour				Physical Activity	
		INT	ATT	SN	PBC	Past	Follow-up**
Theory of planned Behaviour	INT	1	0.47*	0.43*	0.63*	0.34*	0.23
	ATT		1	0.35*	0.36*	0.36*	-0.02
	SN			1	0.40*	0.17	0.09
	PBC				1	0.41*	0.29
Physical Activity	Past					1	0.49*
	Follow-up**						1

*Significant at p <0.01 (one-tailed)

**N = 28

The data showed that there was a significant positive relationship (r = 0.49, p <0.01) between past behaviour and follow-up behaviour measured at time two. There was a significant positive relationship between past behaviour and intention (r = 0.34, p <0.01). However, when using follow-up behaviour this relationship was not seen (r = 0.23, p = 0.16). Therefore, hypothesis 1, which states that past physical activity

behaviour and follow-up physical activity behaviour would correlate with each other and intention was partially supported.

Due to the low response rate from the follow-up questionnaire, there were not enough responses to use the time two questionnaire in the path analysis, therefore the time one IPAQ-SF was used as a measure of physical activity behaviour in the path analysis. Previous research relating to the theory of planned behaviour has used past behaviour (Jenkins & McKenzie, 2010).

3.8 Path Analysis

Path analysis was used to assess hypotheses 2, 3 and 4. Hypothesis 2 stated that carers' intentions to support physical activity behaviour in clients with a learning disability will be predicted by carers' attitudes, subjective norms and perceived behavioural control. Hypothesis 3 stated that physical activity behaviour of individuals with a learning disability will be predicted by both carers' intentions to support this behaviour and their perceived behavioural control of this behaviour. Hypothesis 4 stated that attitude will be the strongest predictor of carers' intention to support clients with a learning disability to engage in physical activity.

Path analysis is an extension of multiple regression, and allows variables to act as both independent and dependent variables (Norman & Steiner, 1998). It provides information regarding the strength of relationships between variables, and it can be used to analyse and compare both direct and indirect effects (Allison, 1999).

3.8.1 Theory of Planned Behaviour Questionnaire

This section outlines the multiple regressions and the path analysis for the TPB questionnaire

Table 3.6: Table to show regression weights, tolerance and VIF of variables in path model in predicting intention and behaviour (as measured by past physical activity behaviour)

Outcome Variable	Predictor Variable	Estimate of regression weight	Standard Error	Standardised Regression Weight (β)	P Value	Tolerance	VIF
INT	**ATT**	0.413	0.147	0.259	0.005*	0.820	1.219
	SN	0.217	0.123	0.166	0.078	0.789	1.287
	PBC	0.475	0.099	0.447	<0.001*	0.784	1.276
Past Behaviour	**INT**	0.080	0.070	0.146	0.253	0.605	1.653
	PBC	0.193	0.075	0.331	0.010*	0.605	1.653

*significant at $p < 0.01$

Table 3.6 shows the regression weights for the path diagram. In the first part of the analysis intention was the dependent variable and attitude, subjective norm and perceived behavioural control were the independent variables. Attitude and perceived behavioural control were significant predictors of carers' intentions to support their client to exercise in this regression. Perceived behavioural control had the highest standardised coefficient, showing it contributed most to intention. Subjective norm was not a significant predictor of intention to support physical activity with the client.

In the second part of the analysis, past behaviour was the dependent variable and intention and perceived behavioural control were the independent variables. Perceived behavioural control was a significant predictor of clients' behaviour. Intention was not significant and had a low standardised coefficient. Figure 3.2 shows this information graphically.

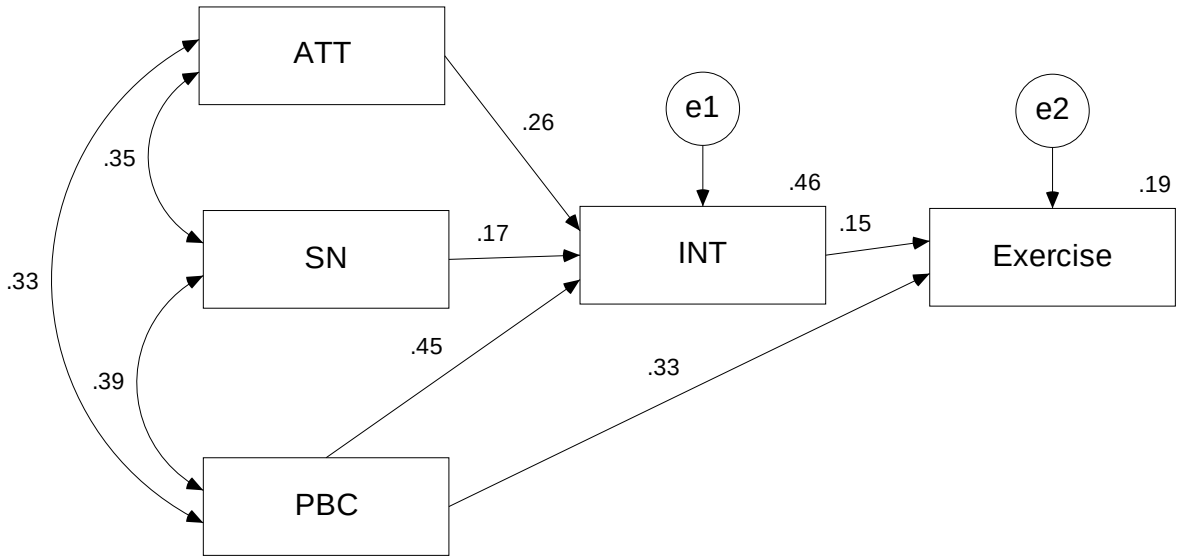

Figure 3.2: Path Diagram of the relationships between attitude, subjective norm, perceived behavioural control, intention and past behaviour, showing path coefficients and error terms

Figure 3.2 shows the path model used to assess hypotheses 2, 3 and 4 from the data collected using the TPB questionnaire. The path coefficients along each pathway are equivalent to the standardised β coefficients obtained from a multiple regression analysis (Bramwell, 1996). These coefficients indicate the strength of the relationship between the variables. The statistical significance of each of the path coefficients is outlined in Table 3.6. Error terms were also determined for each of the regression analysis within the path model. These are shown in the path diagrams at each dependent variable.

The path coefficients represent the strength of the relationship between each pair of variables. However, in path analysis, the indirect pathways between variables are also of interest, and these can be calculated by multiplying the path coefficients along each of the paths between relevant variables (Bramwell, 1996). Hypothesis 5

suggested that intention will act as a mediator variable in the model. A mediator variable can be described as one that explains the relationship between a predictor (independent) and an outcome (dependent) variable (Frazier *et al.*, 2004). Therefore, to examine these hypotheses, the strength of the indirect pathways through intention was calculated and compared to the strength of direct relationships in the model. These relationships are shown in the Table 3.7.

Table 3.7: Table to illustrate the standardised direct and indirect effects of TPB variables on intention and exercise

		ATT	**SN**	**PBC**	**INT**
Standardised direct effects coefficients	**INT**	0.259	0.166	0.447	0
	PastBehaviour	0	0	0.331	0.146
Standardised indirect effects coefficients	**INT**	0	0	0	0
	PastBehaviour	0.038	0.024	0.065	0

The TPB model suggests that intention mediates the relationships between attitude, subjective norms and perceived behavioural control and behaviour. These indirect relationships did not support the notion that intention mediates the behaviour for these data. Perceived behavioural control had a stronger relationship with past behaviour than intention alone, or any of indirect relationships.

The text output from the path analysis also contains the squared multiple correlations, which are equivalent to the r^2 that would be obtained using multiple regression. The squared multiple correlation therefore gives an estimate as to the amount of variance that can be explained by the regressions in the path analysis. The variables of attitude, subjective norm and perceived behavioural control explained

45.9 per cent of the variance of care workers' intentions to support people with a learning disability to partake in physical activity. The variables of perceived behavioural control and intention explained 18.8 per cent of the variance in the past physical activity behaviour of people with a learning disability.

The path model was evaluated for goodness-of-fit using the comparative fit index (CFI) as this is said to be reliable even with small sample sizes and the goodness-of-fit index (GFI). These should exceed 0.95 for a model that fits well (Hu & Bentlar, 1999). In addition, the standardised root mean square residual (SRMR) was examined and this should be below 0.06 for a well-fitting model (Hu & Bentlar, 1999). The path model was an acceptable fit according the multiple criteria that were used ($\chi^2 = 4.278$, $df = 2$, p=0.118; CFI = 0.973; GFI = 0.979; SRMR = 0.046).

3.9 Summary of Results

This section will summarise the main finding of the thesis and tie them back to the hypotheses in section 1.9.

Hypothesis 1: Past behaviour and follow-up behaviour as measured by the IPAQ-SF will correlate with each other and with intention.

- The variables of past behaviour and follow-up behaviour were significantly correlated.
- The variables of past behaviour and intention were significantly correlated.
- The variables of follow-up behaviour and intention were not significantly correlated.

Hypothesis 2: Carers' intentions to support physical activity behaviour in clients with a learning disability will be predicted by carers' attitudes, subjective norms and perceived behavioural control.

- The results showed that TPB variables predicted intention significantly.
- Perceived behavioural control and attitude were significant predictors of intention

Hypothesis 3: Physical activity behaviour of individuals with a learning disability will be predicted by carers' intentions to support this behaviour and their perceived behavioural control of this behaviour.

- Perceived behavioural control had a significant direct relationship.

Hypothesis 4: Attitude will be the strongest predictor of carers' intention to support clients with a learning disability to participate in physical activity

- Perceived behavioural control was the strongest predictor followed by attitude.

4 Discussion

4.1 Overview

As outlined in the introduction, the current evidence base suggests that people with a learning disability may have more complex health needs than members of the general population (e.g. Cooper *at al.*, 2006). The health needs of both groups may be influenced by factors such as physical activity and diet. Research suggests that many people with a learning disability do not engage in physical activity on a regular basis (e.g. Messent *et al.*, 1998) and that, when considering physical activity for people with a learning disability, it may be necessary to consider the role of their carers. Research has suggested that interventions targeted at care staff help people with a learning disability to engage in physical activity (Hawkins & Look, 2006; Melville *et al.*, 2007).

The Theory of Planned Behaviour (TPB; Ajzen, 1988; 1991) has been used to predict many health-related behaviours including physical activity (Norman *et al.*, 2000). There is an emerging evidence base that using the TPB as a model can help to predict the behavioural intentions of one group of people towards another (Andrews *et al.*, 2010; Astrom & Kiwaunka, 2006**;** Brachitta, 2006; Chambers *et al.*, 2007; Hounsa *et al.*, 1993; Jenkins & McKenzie, 2010).

This research project investigated whether the TPB is a viable model for predicting the intentions of care staff to support people with a learning disability to take part in physical activity. The following section will examine the results as outlined in the previous chapter and relate these to the existing literature base. It will then discuss

this research in terms of clinical and theoretical implications. The strengths and limitations of this research will also be examined. It will then discuss future research possibilities.

4.2 Summary of Results

This section will examine the hypotheses of the study individually and relate them to the existing evidence base.

4.2.1 Hypothesis 1:

Past behaviour and follow-up behaviour as measured by the IPAQ-SF will correlate with each other and with intention.

The results of the present study showed that past behaviour and follow-up behaviour had a strong correlation with one another, with a large effect size. This should be interpreted with caution due to the smaller number of people who completed the follow-up questionnaire. It does suggest, however, that the use of past behaviour as a proxy for behaviour is justified in this case due to the strength of the correlation between past behaviour and follow-up behaviour. Past behaviour had a medium correlation with intention as measured by the TPB questionnaire. However, follow-up behaviour did not significantly correlate with intention on the TPB questionnaire. This may be in part because of the lower number of respondents.

There have been previous studies that have used past behaviour as an indicator of present behaviour (e.g. Jenkins & McKenzie, 2010). It is recognised that past behaviour is not the same as actual behaviour or future behaviour but it has been argued that it is a useful substitute (Ajzen, 1991; Ajzen & Fishbein, 2005). Armitage and Conner (2001) have put forward that the use of self-report in measuring

behaviour is somewhat problematic, as respondents tend to overestimate their behaviour. This may be true for care staff, as despite the anonymity of the questionnaires, they may be anxious to appear they are effective at their job and answer in a socially desirable manner. This will be discussed further in section 4.6 where some of the limitations of this study are discussed.

Previous studies have suggested that past behaviour should not be used as a substitute for behaviour, as it adds to the variance of the TPB if used as a variable in its own right. An example of this is in a study of exercise by Norman and Smith (1995). They administered two TPB questionnaires six months apart to students. They found that without taking account of past behaviour, the TPB variables explained 41 per cent of the variance. When past behaviour was added, 54 per cent of the variance was explained. However, Ajzen and Fishbein (2005) are clear that past behaviour should not be given the same status as predictive variable in TPB as they argue it is counterintuitive to say that we behave the way we do now, because of the way we behaved in the past. There has to have been a process in behaving a certain way initially.

Scale compatibility may also be an issue when interpreting the results relating to intention and behaviour. In the present study, behaviour was measured by MET/minute per week and intention was measured by three questions on a Likert scale. In a study about physical activity and the TPB by Courneya and McAuley (1994) participants reported the number of times they took part in physical activity in the last two weeks, and this was measured again four weeks later. At the first time behaviour was measured, the respondents also indicated their intentions to engage in physical activity over the next four weeks. Intentions were measured using two

methods, the first was using a likelihood scale, this was a seven-point Likert scale (extremely unlikely – extremely likely). The second measurement of intention was a numerical scale which asked the number of times that the respondent intended to exercise over the next four weeks. This study found that the numerical scale correlated more highly with the measure of behaviour than the likelihood scale did.

The present study found that intention and past behaviour correlated with one another, but this correlation was of medium size and was lower than in other TPB studies (Hagger *et al.*, 2002). There are a number of factors that may help explain this. The respondents answered the TPB questionnaires about their intentions to support a person with a learning disability to exercise, and the behaviour was measured by the care staff's recollection of the service user's actual engagement in physical activity. Therefore, the methods of data collection may have influenced the compatibility of the data.

Intentions may change over time. The more time that passes, the greater the likelihood that unforeseen events may produce a change in intentions. Ajzen (2005) describes the example of a woman who intends to vote for a particular political party, but after her intentions are measured she learns the candidate standing for that party has beliefs incongruent with her own. As a result of this, she changes her mind and votes for a different party. This means that her behaviour corresponds to her most recent intention, but it could not have been predicted from the earlier measurement of intention. In the present study, factors such as access to transport, or the health of the person whom they support, may have caused staff members to change their intentions.

4.2.2 Hypothesis 2:

Carers' intentions to support physical activity behaviour in clients with a learning disability will be predicted by carers' attitudes, subjective norms and perceived behavioural control.

The present study hypothesised that the TPB is a viable model for predicting the intention of care staff to support people with a learning disability to engage in physical activity. The TPB has been used to predict a variety of health related behaviours in the general population, including exercise (e.g. Norman & Conner, 2005; Haggar *et al.*, 2002). It has also been used in predicting the intentions of one group of people to support another group in a certain behaviour. In the current research study, the model was found to explain a significant proportion of the variance for both intentions and past behaviour. The model explained 45.9 per cent of the variance of care workers intentions to support people with a learning disability to partake in physical activity. The variables of perceived behavioural control and intention explained 18.8 per cent of the variance of people with learning disability taking part in physical activity. Blue *et al.* (1995) demonstrated that between 50 and 70 per cent of the variance was explained by intention to exercise. In line with Blue *et al.* (1995), this questionnaire found that perceived behavioural control and attitude were the most predictive variables, and that subjective norm did not add significantly to the regression.

This is contrary to the results in the Jenkins and McKenzie (2010) study relating to care staff and healthy diet. In this study, subjective norm was found to be the most predictive variable. However, a meta-analysis by Haggar *et al.* (2002) found that attitude and perceived behavioural control both significantly predicted intention to

exercise, whereas subjective norm did not. Armitage and Conner (2001) suggested that the poor performance of subjective norm may be due to it normally only being measured by one question. However, in the current research it was measured by three questions. It should be noted that in the current study, subjective norm had a low Cronbach's alpha value, and this may have had a negative effect. Rutter and Bunce (1989) concluded that in exercise research the lack of influence of subjective norm is explained by the belief that physical activity is the responsibility of oneself. It is possible that staff feel that the people they support are making an active choice of whether or not to take part in exercise, and the influence of other people is not important. These results are not consistent with the other TPB by proxy results discussed in this research. These studies found that found that attitude was the most predictive variable the majority of the studies (Andrews *et al.*, 2010; Astrom & Kiwaunka, 2006; Brachitta, 2006; Chambers *et al.*, 2007; Hounsa *et al.*, 1993); the exception to this was the only study that used carers of adults with a learning disability as the participants (Jenkins & McKenzie, 2010). The majority of these studies also found perceived behavioural control to be a predictive variable (Andrews *et al.*, 2010; Astrom and Kiwaunka, 2006; Chambers *et al.*, 2007; Hounsa et al, 1993; Jenkins & McKenzie, 2009) while only two of the studies found that subjective norm did not add to the variance (Brachitta, 2006; Hounsa *et al.*, 1993).The study by Brachitta (2006) differed slightly to the others as this study looked at the use of car booster seats by parents rather than more health-related behaviours. This is a behaviour that may be more under volitional control, and therefore perceived behavioural control may not influence the intentions or the use of booster seats. This is also a behaviour that may be less likely to be influenced by subjective norm.

4.2.3 Hypothesis 3:

Physical activity behaviour of individuals with a learning disability will be predicted by both carers' intentions to support this behaviour and their perceived behavioural control of this behaviour.

Past behaviour was used as a proxy measure for actual behaviour the path analysis. The current research did attempt to collect data about behaviour in a follow-up questionnaire; but the low response rate meant that these data could not be added to the path analysis. Some previous research in the TPB does not use behaviour, and just attempts to explain intention (Armitage & Conner, 2001). However, as previously discussed other studies have measured past behaviour as a proxy for behaviour (e.g. Norman & Conner, 2005) and Ajzen (1991) suggests that this is a viable proxy measure as the link between past behaviour and future behaviour is so strong.

The results from the path analysis show that care staff intention did not significantly predict the physical activity of the people whom they support. Perceived behavioural control of the care staff significantly predicted physical activity of the client, independently of intention. This is interesting when thinking about supporting people with a learning disability to take part in physical activity as it suggests that interventions may be best targeted at the care staff's perceived behavioural control. Ajzen's (1991) conceptualisation of perceived behavioural control may be best understood as perceived difficulty (Sparks *et al.*, 1997). The barriers to people with a learning disability accessing physical activity have been discussed in the previous sections and may include issues such as staffing ratios, access to transport, beliefs about the choice of the person with a learning disability and cost. There are

implications about how training with regard these issues can be targeted. There are certain perceived barriers that can be addressed with staff teams such as issues relating to choice and duty of care. However, the findings of this research project suggest that there may be wider implications for service providers and people who commission services. These implications include both monetary and staffing issues involved in supporting people with a learning disability to take part in physical activity.

4.2.4 Hypothesis 4:

Attitude will be the strongest predictor of carers' intention to support clients with a learning disability to participate in physical activity.

The limited research on the use of the TPB variables as a way of predicting the behaviour of another suggests that attitude is the most predictive variable. However, the majority of these studies have taken place with parents responding for their children (Andrews *et al.*, 2010; Astrom & Kiwaunka, 2006; Brachitta, 2006; Chambers *et al.*, 2007; Hounsa *et al.*, 1993). Their attitudes may be more significant as a child may develop immersed in these attitudes. The only research, to the knowledge of the author, which has looked at care staff in relation to people with a learning disability, did not find that attitude was the most significant predictor of intention (Jenkins & McKenzie, 2010). Research about the TPB and physical activity often finds that attitude and perceived behavioural control explain significant amounts of the variance. In the current study it was found that perceived behavioural control was the most predictive variable followed by attitude.

The present study found that perceived behavioural control was the most predictive variable in care staff's intentions to support service users to exercise. Some of the

implications of this have been discussed in previous sections and this will be further discussed in section 4.3 regarding clinical implications. Attitude was also a significant predictor of intention, and this also has implications for the training and recruitment of staff. This will also be discussed further in the section regarding clinical implications.

4.3 Clinical Implications

4.3.1 Health Promotion

Several issues emerge as difficulties due to current health promotion focusing mainly on the general population. For example, the physical activity strategy for Scotland focuses mainly on the general population (Scottish Executive, 2003). The strategy also has some specific guidelines for older adults and for children. People with a learning disability are only mentioned once in the strategy document where it suggests there is a responsibility on social services to help encourage people to take part in physical activity. Many of the strategies that are mentioned in health promotion documents such as walking to work, or getting off the bus a stop early, may not be an option for people with a learning disability. People belonging to this population may not be able to leave the house independently or may have additional barriers such as a physical disability. It would be helpful if health promotion materials were made more accessible to people with a learning disability and their carers, and if thought were given to how the guidelines may be incorporated into the lives of people with a learning disability. This may involve more imaginative solutions for people who cannot walk.

4.3.2 Training and Recruitment

The results of the present study suggest that perceived behavioural control has the most influence on the intentions of care staff to support their client to exercise and on behaviour itself. The attitude of the care staff was also a significant predictor of intention to support their client to exercise. The present study did not find that subjective norm was a significant predictor of exercise. This is contrary to previous research with care staff in regards to the TPB (Jenkins & McKenzie, 2010).

It was interesting to note in the research by Jenkins and McKenzie (2010) which investigated care staff members' intentions to support people with a learning disability to have a healthy diet, that subjective norm was the most predictive factor. This suggests that training for physical activity and diet might need to be targeted differently. In the current systems, it is likely that these are targeted together under the umbrella term of health lifestyles (Robertson *et al.*, 2000). Melville *et al.* (2009) found that care staff members were more likely to have knowledge of dietary recommendations than they were to have knowledge about the recommendations for physical activity. However, few of the care staff in this study had full knowledge of the recommendations for either diet or physical activity. This suggests that paid carers have training needs in relation to promoting healthy diets and physical activity levels. They also commented on the need for training initiatives to be flexible and to take into account the heterogeneity of people with a learning disability. They suggest the training needs for carers will vary, depending on the needs of the clients whom they support. This can be a challenge to services due to the high turnover of staff. A solution postulated by Melville *et al.*, is for training on healthy lifestyles to be provided to staff as part of their induction process, and then more tailored

interventions as necessary. These could take place in a traditional face-to-face format, or they could be in the form of electronic or written resources that care staff members can access.

Implementation intentions may be a useful concept in planning interventions for care staff to support people with a learning disability to exercise. Gollweitzer (1999) suggested that simply asking people when, where and how they will carry out their intention can increase the likelihood that they will carry out this intention. People with a learning disability who have support from paid carers should have a written care plan or health action plan (Valuing People, 2002). This provides an excellent opportunity for having care staff and people with a learning disability involved in deciding when, where and how they will take part in physical activity.

The formulation of care plans may be one of the factors that help explain why intention to support people with a learning disability to have a healthy diet is more influenced by subjective norm. The Care Commission has issued standards to which care services are expected to adhere. These care standards have explicit guidance about diet and access to healthy and nutritious food (Scottish Government, 2008). They extend to both support staff in day care, and in those who work in care homes. Due to the fact that diet is explicitly mentioned in the care standards it may be more likely that diet is included in the care plan. This, in turn, may mean that management and other staff are more likely to ensure that dietary issues are reviewed; hence this may impact on the subjective norm of care staff members. There are guidelines in the care standards about keeping healthy, but the focus of these appears to be about taking medication and attending appointments. There is no guidance specific to accessing physical activity.

Gateshead Council in Northern England has recently run a successful pilot of an innovative scheme to help people with a learning disability with regards to healthy living (Gateshead Council, 2010). The council recruited a full-time support worker and three part time support workers with learning disabilities. These posts were part-time to ensure the well-being of the people who were employed. The full-time support worker converted the materials for a health-related Level 2 National Vocational Qualification (NVQ) syllabus into a more accessible format for the part-time workers, and they were allowed additional time to complete the qualification. All three of the workers passed the NVQ. These workers now provide health-related advice to other people with learning disabilities in a variety of areas, including advice about increasing physical activity. The council suggests that this has been a helpful way of rolling out training. The feedback they have received suggests that individuals and families are more responsive to the health messages given by a worker with a learning disability because the experiences of this worker provide a tangible example of how it is possible to overcome some of the barriers to enjoying better health. This type of approach may help address some of the issues of perceived behavioural control.

A group of people with learning disabilities in Oldham have produced a photo book designed to help encourage people with a learning disability to take part in physical activity (British Institute of Learning Disabilities, 2010). It outlines the guidelines for physical activity using large print and symbols. It also contains information about accessing community sports facilities, and some exercises for people who are in wheelchairs.

McIntosh and Cameron (2010) have recently released a training package through the University of Stirling using Talking Mats^{TM} (Murphy & Cameron, 2005) in weight management. It is designed to support weight management in people with learning disabilities by teaching them about healthy eating and gentle exercise. It aims to increase understanding in these areas, while promoting the involvement of service users in their decision making. This has not been evaluated in the literature as yet.

Resources like this can be used in helping both care staff and people with a learning disability. If the care staff members are asked to use these types of resources with their clients, it may improve the knowledge and understanding of the carers as well as that of the people with learning disabilities. If the knowledge and understanding of the client improves this may help them to make more informed choices about their lifestyle.

4.3.3 Issues regarding choice and 'duty of care'

One of the factors that may be important to address in staff training is the demands of choice and 'duty of care'. There have been changes in societal views about people with a learning disability, and these have been led by philosophical movements such as the 'Five Accomplishments for Service Delivery' (Tyne & O'Brien, 1981). The 'Five Accomplishments for Service Delivery' state that a person has a right to make choices in their own life, and that this should include both large and small choices. Wolfensberger (1972) was at the forefront of promoting 'normalisation'. This involved people with a learning disability being allowed the same conditions in society as people who not have disabilities, including freedom of choice.

Promoting choice has also been identified as a key task for carers of people with a learning disability (Jackson & Jackson, 1998). The promotion of choice must, however, also be balanced by the 'duty of care' that care staff members have towards clients who lack the capacity to make an informed choice about certain areas of their lives. 'Duty of care' is defined broadly as the requirement of others to take

reasonable steps to protect the welfare of an individual when that person puts themselves or others at risk (McKay, 1991). 'Duty of care' can override the personal preferences of individuals if their choice is not an informed one or if they lack the capacity to make a valid choice.

Current legislation in the United Kingdom provides criteria for recognising when people lack capacity in making decisions for themselves. In order to be deemed incapable of making decisions under the Adults with Incapacity Act (Scotland) (2000) "a person must be incapable of acting, making decisions, communicating decisions, understanding decisions, retaining the memory of decisions in relation to any particular matter, by reason of mental disorder or of inability to communicate because of physical disability or neurological impairment" (pg. 2) (Scottish Executive, 2000). The Mental Capacity Act (England and Wales) (2005) uses similar criteria. These Acts recognise that capacity is a dynamic process, and that people should be supported to gain necessary experience to allow them to make decisions themselves. Care staff may have a role to play in helping educate service users about the consequences of decisions they make. In order to do this it is vital that members of care staff are aware of their 'duty of care'.

Messent and Cooke (1999) reviewed the literature specific to choice and physical activity for people with a learning disability. They suggested that if 'normalisation' was adhered to for people with a learning disability, that the rates of physical activity and obesity should be the same as in the general population. They suggest that for a person with a learning disability to make a 'real' choice, they may require appropriate support.

There has been research that suggests that some care staff can find it difficult to balance the concepts of choice and duty of care. McKenzie *et al.* (1999) conducted a

study which investigated issues relating to duty of care and the choice of the client in relation to healthy eating. In this study, the researchers presented staff with a series of vignettes involving situations that had a conflict between the wishes of the client and the staff members duty of care. They found that carers were not always confident about how they would manage these situations. Despite the small numbers in this study, it does highlight some of the difficulties that care staff have with balancing the facilitation of client choice and their duty of care to that client.

A review by Smyth and Bell (2006) found that although many have undertaken the goal of encouraging choice for people with a learning disability, it might be that in doing so that health consequences were not always prioritised. This review was written in relation to diet but the principles may be transferable to physical activity. They discussed previous research which regarded unhealthy food choice as acceptable (Bannerman *et al.*, 1990), and which inadvertently encouraged unhealthy eating, by, for example, encouraging clients to cook microwave meals (Bechtel & Schreck, 2003; Cooper & Browder, 1998). A key conclusion of this review was that 'duty of care' for a person with a learning disability should not be overridden in a misguided attempt to allow choice in circumstances where this is unsuitable for the person. They also commented that the attitudes and beliefs of care staff are likely to affect choice-making for the person receiving care.

A small qualitative study that took part in North East Scotland, illustrated that people with learning disabilities, their family carers and their care staff held positive views about autonomy and personal choice regarding the health of the people with a learning disabilities (Young, 2007). The study involved 20 people with learning disabilities, 10 family carers and 10 care staff. The study found that care staff seemed

to hold a variety of views about autonomy and the participants struggled with the dilemma of personal choice versus risk reduction. The study was small and this may have affected the generalisiability. However, it did give some useful insight into the views held by the individuals involved. This includes particular issues faced by carers on the subject of choice. This could be taken to provide evidence for the issue of the discrepancies between different people's opinions over what constitutes promoting choice and autonomy and as to what might actually be a 'duty of care' issue.

In cases where a client does not have capacity, those who support him/her have a duty of care to take steps to protect the welfare of the person and do what is in their best interests.

The assessment of capacity can be a complicated process, even for skilled practitioners with high levels of education, yet we are asking low-paid care workers to make these decisions on a day-to-day basis with regard to the people whom they support.

4.4 Theoretical implications

The current research adds to the emerging evidence base that suggests that the TPB can be used as a viable model for predicting the intentions of one group of people towards the behaviour of another. This has important implications for developing training and interventions as discussed in the previous section.

The TPB has been shown to be useful for predicting care staff intentions in both diet (Jenkins & McKenzie, 2010) and physical activity. It is possible that this theory may also be applicable in other situations with care staff. An example might be in reducing challenging behaviour. There is already a strong evidence base suggesting

that attitudes of care staff may be integral to this work (Bell & Espie, 2002 ; Dagnan *et al.*, 1998).

4.5 Other Implications

There were some additional implications about the care of adults with a learning disability raised by the present study. Only 38.5 per cent of the care staff in this study intended to support their clients to engage in physical activity, despite higher numbers having a positive attitude to physical activity. This indicated there may be a role for education about the benefits of physical activity for people with a learning disability. There may also be a role for education about the duty of care that care staff have for the people whom they support. Each of the organisations that took part in the study will be contacted and arrangements will be made to disseminate the finding of the research. A written summary will also be made available to the participants who completed the questionnaires online. This will provide the participants with the opportunity to increase their knowledge about the potential issues.

The results of this research indicate that 70 per cent of people with a learning disability are not supported to take sufficient exercise. While the general population may also have relatively low levels, there are additional issues for people with learning disability regarding choice, capacity, duty of care, and additional health issues. As outlined in the introduction, people with a learning disability are at increased risk of many health conditions including heart disease (Hermon *et al.*, 2001), osteoporosis (Aspray *et al.*, 1998) and some mood disorders (Cooper *et al.*, 2007). Physical activity has been suggested to be a modifiable risk factor for these health conditions (Warburton *et al.*, 2006). There is an responsibility on services to

support people with a learning disability to achieving a healthy lifestyle (Melville *et al.*, 2008).

4.6 Limitations

4.6.1 Use of Proxy respondents

The TPB questionnaire in the present research was designed to examine the intentions of care staff to support people with a learning disability to take part in physical activity. However, in the measurement of behaviour, this research relied on proxy-respondents, the care staff answered the questions in relation to a person whom they support. This was partly addressed by defining the behaviour as one which involves care staff, rather than just the activity. There is limited evidence on the reliability and validity of using proxy-respondents in research involving adults with learning disabilities and physical activity. However, there should be some criteria that determine if the information received from the proxy-respondent is similar to what the individual concerned would provide. The proxy-respondent should have a good knowledge of the person, a relationship with them and regular contact with them in order to respond reliably to questions (Stancliffe, 2000). It can be difficult to validate this with people with learning disabilities for several reasons including: communication difficulties, acquiescence and cognitive limitations.

The relationship between the person with a learning disability and the proxy respondent can influence the reliability of the proxy respondents' response. Schwartz and Rabinovitz (2003) suggests that staff proxy respondents overestimate life satisfaction of people with a learning disability, and they concluded that this may be a consequence of the staff's desire for their work to be viewed favourably, even if

these beliefs do not reflect the experiences of the person with a learning disability. This study looked at quality of life which may be more open to interpretation than the measurement of a behaviour, such as physical activity. The research by Schwartz and Rabinovitz (2003) suggests that care staff may answer questions in a socially desirable way. This may also affect how they answered about the TPB variables in addition to the questions about physical activity.

Studies regarding physical activity in the general population are generally conducted using self-report recall surveys. This is problematic in people with a learning disability as research suggests that they may find it difficult recall and provide the information on their physical activity (Temple *et al.*, 2000). These factors regarding the use of proxy respondents may have an impact on the reliability and validity of the measure.

4.6.2 Path analysis

When using path analysis the researcher hypothesizes the model and the relationships between variables. This research is based on a model that is shown to have predictive ability in the general population but there may be alternative models that would represent this data set equally as well. Petraitis and colleagues (1996) state that, as a rule of thumb, the sample size should be approximately five to 20 times larger than the number of estimated paths to ensure reliable results. This study had five paths and 78 participants, and so is within these limits.

4.6.3 Adaptation of questionnaires

The present study used adaptations of several questionnaires which may have an impact on the reliability and validity of these questionnaires. The TPB questionnaire

was adapted from a well-established questionnaire (Norman & Conner, 2005). This questionnaire was adapted as outlined in section 2.6.3. The IPAQ-SF was adapted for use in this research in order to measure behaviour. This was chosen as it examines the amount of physical activity taken part in terms of vigorous and moderate physical activity and walking. This allowed us to compare the results of the current research to the recommendations for health. The IPAQ-SF also has acceptable validity and reliability scores when used in the general population. The authors of this questionnaire (Booth, 1996) do acknowledge that a limitation of the IPAQ-SF is that it is normed on healthy middle-aged adults and may not be generalisable to people with disabilities. The IPAQ-SF will be discussed in more detail in the following section on measuring behaviour.

4.6.4 Measuring Behaviour

One of the criticisms of the TPB has been the difficulty in measuring behaviour. Armitage and Conner (2001) found that the TPB accounted for 31 per cent of the variance in models where behaviour was self-reported and 20 per cent of the variance when a more objective method of measuring behaviour was used. In the current research, behaviour was measured using an adapted version of the IPAQ-SF with reference to the person they support. Previous research suggests that proxy respondents are subject to the same errors in self-report measurement as in normal self-report (Sirard & Pate, 2001). In addition, there is also research that suggests that when staff complete questionnaires about the people with whom they work, they may respond in a socially desirable manner (Schwartz and Rabinovitz, 2003). There are other methods that can be used in measuring physical activity and these will be explored in more depth in the section discussing future research.

4.6.5 Generalisability

There were a number of factors that may have impacted on the generalisability of the results and these will be discussed here.

There was a low response rate to the paper questionnaires which may have been in part due to the methodology of the data collection. All of the agencies that took part requested that the questionnaires be distributed through their head offices. There is a suggestion that people are more likely to return questionnaires if they have had an opportunity to talk to the researcher (Edwards *et al.*, 2002). The response rate may also have been influenced by the amount of physical activity in which the clients engaged. It is possible that keyworkers who did not support their client to engage in physical activity were less likely to return the questionnaire. The information sheet requested that the questionnaire be filled in by the keyworker of a person with a learning disability. This narrowed the pool of potential participants but was necessary in order to ensure that the questionnaires were not being answered about the same person with a learning disability. Steps were taken to try to improve the response rate, such as including stamped addressed envelopes, and trying to make the questionnaire as user friendly as possible. The care agencies that agreed to take part were also telephoned to remind them about the study.

The response rate to the paper follow-up questionnaire was also low. This is in keeping with previous research (Berdie *et al.*, 1986). The factors mentioned previously may have had an effect on the amount of questionnaires returned. Due to the time elapsed between questionnaires, people may have forgotten to fill in the follow-up questionnaire. In addition, people may have lost or misplaced the follow-up questionnaire as they were distributed together.

It is not possible to determine the response rate to the online questionnaire, as it is not known how many people accessed the questionnaire. However, the response rate to the follow-up questionnaire on the online version was similar to that in the paper version. A reminder post was placed on the forums but this did not increase the response rate. These response rates suggest that there may have been a self-selection bias, where people who are more motivated in an area are more likely to respond. This is supported by the number of positive responses about behavioural intentions in the current research.

Another factor that may influence the generalisability of the findings is the amount of time the care worker spends with the person with a learning disability. It is possible that the keyworker for an individual was working nights and therefore felt unable to fill in the questionnaire accurately, as they were not aware of their daytime opportunities for physical activity.

There are several limitations outlined that may have influenced this research. These are important to note and may affect the generalisability of the results, but the research also has a number of strengths that are also important to reflect on and these will be discussed in the following section.

4.7 Strengths

The present study had a good sample size, and met the minimum number of participants required to use appropriate statistical analysis. There were no missing data in the questionnaire used in this study.

The present study has added to the emerging evidence base about using the TPB as applied to one group of people's intentions toward another. There have been several

studies that have looked at parents' intentions toward supporting their children in certain behaviours (Andrews *et al.*, 2010; Astrom & Kiwaunka, 2006; Brachitta, 2006; Chambers *et al.*, 2007; Hounsa *et al.*, 1993). More recently, the intentions of care staff have been shown to be predictive in supporting people with a learning disability to eat healthily (Jenkins & McKenzie, 2010). The current study shows the TPB is a viable model for predicting intentions to support people with a learning disability to take part in physical activity. The TPB may also be helpful when thinking about care staff intentions to support people in other activities, and this is an area that is discussed in the section relating to future research.

Identifying which variables of TPB are most predictive of intentions and behaviour, can be helpful in designing training programmes for staff. It may also be helpful to identify staff who would have a positive influence in services at the recruitment stage.

Much of the research about physical activity in people with a learning disability includes only ambulatory adults. Some people with learning disability have concurrent physical disabilities (Hatton, 1998), and it is important that these people have access to physical activity. It is a strength of this research that it has included these people. The barriers to physical activity may be different for these people, but it does not make them any less important.

Many studies regarding the TPB only measure intention, and do not measure behaviour. It is a strength of this study that it attempted to measure both past behaviour and a follow-up measure of behaviour. It is unfortunate that it not was possible to include the follow-up measure of behaviour in the path analysis due to the number of people who responded to the second questionnaire.

The findings of this research are in keeping with the findings of previous research that suggests that the physical activity levels of people with a learning disability are lower than those of the general population. The results of the present study suggest that activity levels of people with a learning disability are not as low as they have been at other points (e.g. Messent *et al.*, 1998). These results are similar to the results of a more recent Scottish study (Finlayson *et al.*, 2009). It may be that the benefits of physical activity are becoming more understood by people with a learning disability and their carers. However, it is important to note that the generalisability of the finding may be affected by the self-selection of the participants who took part in the research, and that the care staff may have answered in a socially desirable manner.

This research is the first study, to the researcher's knowledge, to use the TPB as a model for predicting the intentions of care staff to support people with a learning disability to exercise. It is only the second study to examine the TPB with care staff of people with a learning disability. Research in the past had suggested that it might be a useful model in this population (Jones & Hasting, 2003).

4.8 Future Research

As outlined in section 4.6 the IPAQ-SF may not be the most valid and reliable instrument for measuring physical activity behaviour in people with a learning disability. Lante (2007) has submitted a PhD developing a version of the IPAQ for people with a learning disability that is completed by carers. It may be helpful in future research to use a tool such as this. However, this questionnaire does require further research in order to establish its psychometric properties further.

In section 4.6 some of the potential difficulties with using proxy respondents were outlined. Although there are difficulties with accurate recall with people with a learning disability, it may be useful to ask people with learning disabilities about how much exercise they have participated in. A paper or online questionnaire may not be useful for this, but there is growing evidence for using methods such as Talking Mats™ (Murphy & Cameron, 2005), or interviewing people with a learning disability.

Another method of collecting data about the physical activity of people with a learning disability may be the use of diaries. This was decided against in the current research as it was felt it may be too onerous on staff, and that there may be issues with the response rate. A further method that may yield a more accurate measure of behaviour is the use of accelerometers or pedometers to record the amount physical activity a person has undertaken.

The focus of this study was to look at the TPB variables that influence the intention of care staff to support a person with a learning disability to take part in physical activity. It would be interesting to also investigate these factors in relation to care staff taking part in physical activity themselves. Melville *et al.* (2009) found that the health benefits of diet seemed to be more readily identified by paid carers than the health benefits of physical activity. This may be partly explained by the care staff's lack of knowledge about the public health recommendations for physical activity. However, it may reflect their own general attitudes to physical activity.

The remit of this study was to look at intentions of paid care staff in a residential setting. An important next step for research may be looking at these factors with familial carers. A large proportion of adults with a learning disability continue to

receive support from familial carers. A recent study by Finlayson *et al.* (2009) found that 39.9 per cent of people with a learning disability in the west of Scotland lived with their family. Other studies have estimated the number of adults with a learning disability living in the parental home to be as high as 50 per cent (Valuing People, 2002). Finlayson and colleagues (2009) concluded that in addition to offering paid care staff training about physical activity, there is also a role for engaging family carers in this training. There are no suggestions in their paper as to how this may be achieved. It is a challenge, as it would seem likely for paid carers that the onus would be on the care providers to make training available to their staff. It may be that for familial carers the responsibility for providing this training may lie with health professionals.

It may also be useful to examine these factors with day care staff. This may provide an additional avenue for supporting adults with a learning disability to take part in physical activity. By including day care staff in interventions, it may widen the amount of opportunities that people with a learning disability have to access physical activity. If day care staff are involved it also allows that people who live in residential settings, as well as those who live with familial carers to be afforded these opportunities.

The TPB has been found to be an applicable model for predicting paid carer intentions in relation to diet (Jenkins & McKenzie, 2010) and in the current study to physical activity. In addition, the TPB has been used in the general population in a variety of behaviours from diet (Armitage & Conner, 1999), exercise (Norman & Smith, 1995) to other behaviours such as blood donation (Armitage & Conner, 2001) and motor cyclists' intention to speed (Elliot, 2010). There may be benefit for

investigating the TPB's applicability in relation to carer intentions to other behaviours. An example that might be interesting would be in relation to carers' intentions to support people with a learning disability in behavioural management. Jones and Hastings (2003) suggested that TPB might be a useful theoretical perspective to use when thinking about why care staff respond to challenging behaviours in the way they do. They suggest the three determinants of intention can be conceptualized for this group in the following ways:

- Attitude towards a behaviour or belief about the outcome of a behaviour seems to be closely linked to Weiner's (1985) expectancy of success.
- Subjective norm may be important in this population as Hastings and Remington (1994) suggest that the beliefs and advice of other staff are important in determining staff responses to challenging behaviour.
- Perceived behavioural control is likely to have an influence as perceptions of control over challenging behaviour have been found to predict staff negative affect in other research (Hastings & Brown, 2002).

Recent research suggests that there may be value in extending the TPB to include other variables (Conner & Armitage, 1998). Previous research using the TPB as a "proxy model" has attempted to expand the TPB. Chambers *et al.* (2007) added two additional variables to her research about TPB, these were self-efficacy and self-identity. The finding from their research found the addition of these variables added to the amount variance explained by the TPB. Jenkins & McKenzie (2010) also added these variables to the TPB to extend the model. They found it increased the variance explained slightly, but meant the original TPB variables were no longer as

predictive. They hypothesized that it may be that these variables were not relevant for care staff of adults with a learning disability for a number of reasons. An example was that self-identity may not be as important when working on behalf of an organisation, and that subjective norms may be more influential in this case.

Francis *et al.* (2004) produced a manual for health care researchers using the TPB. This manual provides a step-by-step guide integrating TPB literature from a variety of sources (e.g. Ajzen, 1988; Conner & Sparks, 1995; Godin & Kok, 1996). This guide suggests that to construct a reliable TPB questionnaire it is helpful to use a combination of qualitative and quantitative research methodology. The qualitative part consists of having a pilot focus group from the population of interest to elicit information about the TPB variables. They suggest the researcher should elicit these beliefs and then use content analysis to label these themes. The questionnaire should be constructed using these themes and piloted on a small group of potential participants. It would be helpful for future research to consider constructing a TPB questionnaire using these guidelines. It is possible that questionnaires could be constructed for care workers. The use of tools such as Talking Mats™ may also make it possible to elicit the beliefs of people with a learning disability and to construct questionnaires for use with this population too.

4.9 Conclusions

There were a number of significant relationships between the variables that measured the TPB, suggesting it is a useful framework to start thinking about possible interventions. These interventions should support care staff to encourage the people whom they support to take part in physical activity. The results of the path analysis suggested that perceived behavioural control had the most influence on both

intention and behaviour. This may mean it is necessary to try and tackle some of the larger barriers to people with a learning disability accessing physical activity such as monetary issues, staffing levels, transport and the availability of relevant services. The attitude of care staff was also a significant predictive factor, and so there may also be scope to work with staff to help them to work more positively with people with a learning disability with regard to physical activity.

There are a number of limitations to the current study, and it is important to give them consideration when interpreting the findings. However, there are also a number of strengths of the study, including an appropriate sample size and the heterogeneity of the sample. These strengths will contribute to the findings being more generalisable.

The findings from this study have some important clinical implications, and may help in designing future interventions. There are barriers to physical activity that need to be addressed, or more imaginative solutions need to be found. It may be possible to work with care staff in a problem solving way to find methods they could use to help overcome some of the perceived barriers to physical activity. There may also be interventions designed to alter care staff attitudes, and therefore maybe increasing the likelihood that they will help the service users they support to access physical activity. The findings from the study also highlight that it may be helpful to have additional training for staff about the difficult balance between client choice and duty of care.

This study contributes to the knowledge base regarding the use of the TPB as a model for predicting one group of people's intentions towards the behaviour of another group. It is only the second study to the knowledge of the author that looks at

this model with care staff of people with a learning disability. It is unique in looking at physical activity with this population.

Future research would benefit from developing and possibly expanding the model. It was also be helpful to use the model with care staff about different behaviours, and to investigate if it is also predictive with familial carers and day care staff.

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6 Appendices

6.1 Appendix 1: University Ethics Form

Doctorate in Clinical Psychology

Thesis Ethics Proposal

(IRAS derived version)

Provisional Thesis Title: Carers intentions to support people with a learning disability to exercise: An application of the theory of planned behaviour.

Trainee Name: Emma Martin

Proposed Thesis Project Supervisors

Clinical	Dr. Keith Bowden
Possible Academic 1	Dr. Emily Newman
Possible Academic 2	Dr. Karen McKenzie

Proposed setting: Care agencies from central Scotland who provide home-based residential care to adults with learning disabilities (Forth Valley, Glasgow and Mid/East Lothian)

(Where research will be carried out)

Anticipated Month & Year of Submission of Thesis: 1st February

(please delete as applicable)

2010

(Must be in final year for full time trainees. For flexible trainees, the month & year of submission will depend on their Individual Training and Development Plan)

Please Note: Most of the questions in this form are deliberately identical to questions contained in the NHS IRAS Research Ethics form. The corresponding ethics form question numbers are given in parentheses. Thus if the proposal is satisfactory, answers completed here may be pasted directly into the ethics forms.

Version (date): May 18th 2009

Overview of the Research

1) Please provide a brief summary of the research (maximum 300 words) using language easily understood by lay reviewers and members of the public (IRAS A6-1)

This research plans to investigate if the theory of planned behaviour will provide a useful model for predicting carers' intentions for supporting adults with a learning disability to participate in exercise. Previous research shows that adults with a learning disability share their decision making power with carers (Emerson *et al.* 2001) it is for this reason this project aims to look at key workers' intentions to support the service users in participating in exercise.

The research will be questionnaire based and it will be necessary to adapt existing measures of theory of planned behaviour and to pilot the questionnaire. Participants will be asked to complete the theory of planned behaviour questionnaire and the Godin Leisure Time Questionnaire to measure past exercise behaviour. In addition the will be asked to complete this measure again a week after filling in the theory of planned behaviour questionnaires in order to measure actual behaviour.

2) Please summarise the main ethical and design issues arising from the study and say how you have addressed them. (IRAS A6-2)

Individuals with a learning disability are a vulnerable population and in this study it is proposed that care staff will be asked about aspects of the care they provide to this population. The questionnaire responses may highlight examples of staff providing less than optimal care to the individuals they support. As all responses are anonymous it will not be possible to feed this back to individual agencies. However a summary of the project will be provided to all agencies, which will include the results of the study and could include examples of good practice.

As this is a questionnaire based study it is unlikely it will cause the participants' any distress. In the event that any participant wishes to withdraw from the study he or she will be free to do so. This will be made clear from the outset of the research.

Participant information sheets will outline the purpose of the research. Participants will be asked to sign a consent form if they agree to take part in the research. All responses to questionnaires will remain anonymous.

3) What is the scientific justification for the research? (IRAS A12)

According to the Health Education Board for Scotland, a 2-stage approach exists in order to encourage individuals to increase exercise levels, which is outlined in the Promotion of Physical Activity in Scotland (HEBS, 1997). This aims to encourage those who are inactive to partake in at least 30 minutes of moderate exercise (activities that make you breathe somewhat harder than normal) at a minimum of 5 times a week, and those who already exercise regularly, should be encouraged to engage in vigorous activity (exercise that involves hard physical effort that makes you breathe much harder than normal, such as, running or fast cycling) for a minimum of 20 minutes at least 3 times a week.

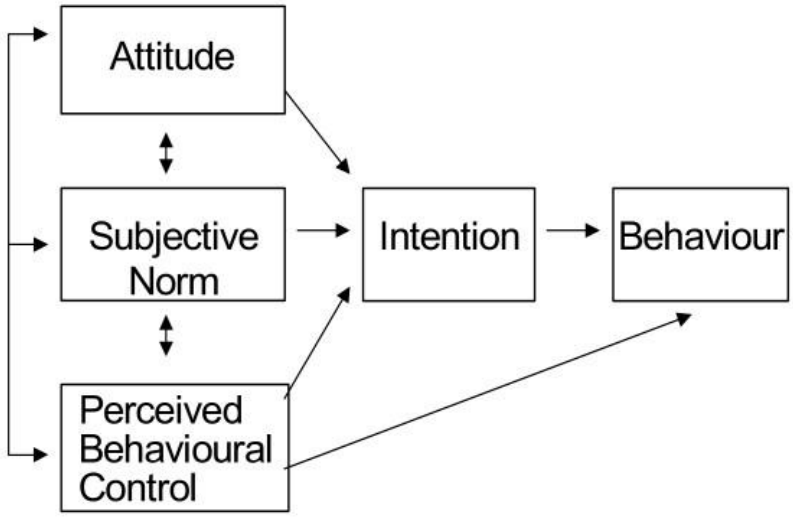
In addition to the physical benefits of exercise, research supports the contention that physical activity contributes to psychological well being in both healthy and clinical populations, such as people who suffer from depression and anxiety (Biddle, 2000). In addition, there is evidence that exercise can have a wider impact for people with a learning disability including: contributing to a reduction in difficult behaviours (Gabler-Halle *et al.*, 1993), reducing levels of self-injurious behaviours (Neri &Sandman, 1992) and also increasing acceptance, and integration into the wider community (Rimmer, 1993). Despite these benefits, when the fitness of people with a learning disability was compared to the general population it was found that both men and women were less active and that more than 93% of adults with a learning disability did less than 1 hour of moderate exercise a week (Messent, 1998).

Other evidence suggests for adults with a learning disability living in residential accommodation, service characteristics such as staffing ratios and the existence of a care plan, have a significant influence on their access to community (Emerson & McVilly, 2004). Therefore, carers who work with adults with a learning disability often pay a key role in promoting integration into the community, including access to exercise.

The theory of planned behaviour postulates that the main determinant of behaviour is the persons intention to perform the said behaviour (e.g. “I intend to support x to exercise regularly of the next 3 weeks”). This is a person’s motivation to perform a behaviour and it is expected that people who have strong intentions will be more likely to exert the effort required in order to achieve their goals. Ajzen (1998) believes intention is determined by three constructs:

1. Attitude: The persons attitude towards the behaviour refers to their positive or negative evaluation of performing the behaviour (e.g. “My supporting x to exercise over the next 3 weeks would be good/bad”)
2. Subjective Norm: This refers to the perceived social pressure from important others to perform or not perform the behaviour (e.g. “People who are important to me think I should support x to exercise over the next 3 weeks”)
3. Perceived Behavioural Control: This refers to the amount of control the person feels that they have over performing the behaviour. (e.g. “My supporting x to exercise regularly over the next 3 weeks would be easy/difficult”). The questions that measure perceived behavioural control should measure internal (e.g. self-efficacy and skills) and external (e.g. opportunities and constraints) control factors

This is illustrated below:



The theory of planned behaviour has been used to make a model with predictive powers for many health related behaviours including quitting smoking (Willemson, 1996), attending health clinics (Norman & Conner, 1996) healthy eating (Chambers et al, 2007) and exercise specifically (Norman et al, 2000). The majority of the research uses self-report measures but there are also examples which used “by proxy” measures. Recently the model has been used to predict healthy eating behaviour in adults and children. When predicting children’s eating behaviour, Chambers et al used parental responses rather than children’s own rating of intention. Chambers *et al.* (2007) justified their use of parental response by pointing out that parents often make decisions about eating for or with their children. Similarly, Astrom and Kiwanku (2006) found the theory of planned behavior was predictive with regards to parents limiting their children’s sugar consumption. These papers, therefore, use the theory of planned behavior to examine one group’s intention to perform a particular behaviour with another. In addition to these papers, a recently submitted D.Clin.Psych thesis in the University of Edinburgh (Smyth, 2009) used

carer responses to look at intentions to encourage a healthy diet in adults with learning disabilities. As people with a learning disability often share their decision making with their carers we are interested in investigating whether this model is predictive when applied to the intentions of care staff about the people with learning disabilities they support.

The aim of this research is to investigate whether the theory of planned behavior provides a useful model to predict exercise supported by their keyworker for adults with learning disabilities who live in residential care. Greater knowledge and understanding of those factors that predict exercise in adults with a learning disability may inform future interventions for increasing exercise behaviour to improve both psychological and physical health of the service users.

Purpose and Design of Research

Research Questions / Objectives:

(Keep these focused and concise, with a maximum of five research questions).

4) What is the principal research question / objective? (in language comprehensible to a lay person) (IRAS A10)

The principal aim of the research is to test whether the theory of planned behaviour can be used to predict the intentions among carers to facilitate exercise with the adults with learning disabilities whom they support.

The hypothesis of the study is:

The components of the theory of planned behaviour will predict carers' intention to support service users to exercise in the future. These components are listed below.

1. The attitude of the carer
2. The normative beliefs of the carer
3. Perceived behavioural control

5) What are the secondary research questions / objectives if applicable? (in language comprehensible to a lay person) (IRAS A11)

6) Please give a full summary of your design and methodology. It should be clear exactly what will happen to the research participant, how many times and in what order.

(Adapted from IRAS A13)

Participants (staff) will be recruited from agencies that provide residential care to adults with a learning disability. Emma Martin, Trainee Clinical Psychologist will be responsible for all aspects of data collection for this study. Potential participants will be identified following permission from the care agencies head offices. They will be provided with written and verbal information regarding the study. If they decide to participate they will be asked to sign a consent form. Participants will be informed that opting-in or –out of the research will not affect the treatment of the service users or themselves now or at any point in the future. Participants will be assured that they are free to withdraw from the study at any time without penalty, and that their responses to the questionnaires will be made anonymous. The questionnaires will be given in a document wallet and will be uniquely numbered. This will done as behaviour will be measured on two occasions once at the time of the initial questionnaires (past behaviour) and then will be followed up 1 week later. The participants will be given a stamped addressed envelope to return the follow up questionnaire. A date will be organised for the follow up questionnaires to be posted in consultation with the participants at the time of the initial questionnaires.

Participants recruited will be keyworkers of adults with learning disabilities who live in the community supported by care agencies. Keyworkers were chosen as the participants for research to avoid having multiple responses about the same service user.

After participants have consented to take part in the study, they will meet with the researcher once at which time the questionnaire will be administered. This should take no more than 10 minutes. This can be done in groups or individually. Once the questionnaire has been given to participant they can fill it in at the time and return it at the time, a box will be provided for staff to return responses anonymously. Alternatively they can fill it in at a later date and return the questionnaire by post, a stamped addressed envelope will be provided. It is expected that any meetings with staff will take place in their place of work.

7) Please list the principal inclusion and exclusion criteria (IRAS A17)

Inclusion

Keyworkers of service users who live in the community with support from care agencies

Both the keyworker and the service user should be aged 18 years plus.

Exclusion

Staff who have literacy difficulties that they feel will impede their ability to fill in the questionnaire.

Staff who have been working with the service user for less than 3 months

Risks and Ethical Issues

8) How long do you expect each participant to be in the study in total**?** (IRAS A21)

(Give brief details)

The total length of time for the participants to fill in the theory of planned behaviour questionnaire should not exceed 10 minutes. In addition to this there will be time available if required to discuss the project with the researcher and to answer any questions. This should not exceed 30 minutes.

9) How and by whom will potential participants, records or samples be identified?

(IRAS A27-1)

In order to identify potential participants I intend to contact agencies that provide residential care to adults with learning disabilities in the identified regions by email, telephone or letter. The initial contact will be made with the agencies head offices.

When an agency has agreed to take part in the research I will then ask them if they could identify services where adults with learning disabilities live, where I would be able to recruit participants. I would then contact each service and make the

participant information sheet available and see if they wish to take part in the research. If they were agreeable to taking part in the research I would request that I be able to attend one of their team meetings. At this meeting I would discuss the study with the potential participants and answer any questions that they may have. If the potential participants were agreeable to taking part in the research I would give them the questionnaires at this point. They would also have an option to contact me later if they felt they required further time to think about their participation.

I would then allow them time to fill in the questionnaires and collect them once they were completed. By remaining in the building I will be able to answer any questions that arise while they are completing the questionnaires.

10) Will any participants be recruited by publicity through posters, leaflets, adverts or websites? (IRAS A28) (If Yes, please give details of how and where publicity will be conducted, and enclose copy of all advertising material).

No

11) How and by whom will potential participants first be approached? (IRAS A29)

The participants will initially be approached by the researcher following permission from their central offices. I would discuss with the head offices the most appropriate way to contact each of the services. Methods would include by mail, by phone or by email. The services would be sent the participation information sheet before meeting with the researcher. There is no obligation for staff to take part in this research after the researcher has visited the service.

12) Will you obtain informed consent from or on behalf of research participants? (IRAS A30-1)

(Please give details of who will take consent and how it will be done, with details of any steps to provide information. Include `Patient Information Sheet' and `Consent Forms' in Appendix where applicable).

I will obtain informed consent from the participants in the research. The potential participants will be given written information that outlines the study. In addition to this I will be attending the staff team meetings and will be available to discuss any concerns or answer any questions that the participants may have. Before the participants are given the questionnaires to complete they will be asked to sign a written consent form. These consent forms will be stored in a locked filing cabinet along with the paper copies of the questionnaires. The consent forms will not be matched to the responses in order to maintain confidentiality.

The data will be anonymous in line with the Data Protection Act 1998. At no point will the participants be asked to give any identifying information. The questionnaires will be assigned participant numbers for the purpose of entering and matching data.

Only the researcher will have access to the data. The data will be kept on a password protected file on a single computer. All data, both written and electronic will be destroyed following the project.

13) How do you intend to report and disseminate the results of the study? (IRAS A51)

In order to feed back the results to the participants of the research I will provide them with a written summary of the research conclusions. I will also be willing to provide verbal feedback on request.

I also plan to give the local community learning disability teams of the areas from which I recruit the option of having feedback about the research.

Research findings may be presented at local, national and international conferences.

In addition, this project will be written up as a part requirement of the researcher's doctoral training in clinical psychology. This will be written in a thesis format.

I also hope to write a paper outlining the main findings of the research for publication in a relevant journal.

Scientific and Statistical Review

14) How will data be collected?

If quantitative, list proposed measures and reason for inclusion. If qualitative, explain how data will be collected giving reasonable detail (don't just say 'by interviews')

The data will be collected using a Theory of Planned Behaviour questionnaire. There is no standard theory of planned behaviour measure, but a questionnaire will be made adapted for the purpose of this research in line with Ajzen (1988) recommendations. These questionnaires are likely to be similar to those used in other research about the theory of planned behavior and exercise (Norman, *et al.*, 2000; Norman and Smith, 1995; Brenes *et al.*, 1998).

Behaviour will be measured using an adaptation of the Godin Leisure Exercise Questionnaire.

The participants themselves will fill in these questionnaires. It was felt that for the questionnaires to be administered by the researcher may be more lengthy and time-consuming for the participant and in a paper-and-pencil format questions could be answered more quickly. Also some of the questions may be perceived as sensitive in nature as they relate to health of the people who the participants support. There was a concern keyworkers may be unwilling to discuss their intention to support the service user to exercise.

15) What is the sample size for the research? How many participants / data records do you plan to study in total? If there is more than one group, please give further details below. (IRAS A59)

It is planned that the data will be analysed using path analysis, which is an extension of multiple regression. Path analysis allows variables to act as both independent and dependent variables and provides an estimate of the magnitude of the relationship between variables, as well as a test of the proposed model (Mapp, 2006).

Cohen (1992) states the sample size required for 0.80 power (alpha 0.05), assuming a medium effect size with 4 predictor variables in multiple regressions to be 84.

I would therefore aim to have at least 84 participants.

16) Outline reasons for your confidence in being able to achieve a sample of at least this size (e.g. by giving details of size of known available sample(s), percentage of this type of sample that typically participate in such studies, opinions of relevant individuals working in that area)

From the Quality Improvement Scotland document (2006) there are approximately 7,500 people with a learning disability in Forth Valley. Of these there were 852 adults known to the community learning disability teams at the time of the publication of the document. The number who are receiving residential care from organisations s likely to be less than this but it is still hoped there would be sufficient numbers for a representative sample for this project.

In addition to this I hope to be able to recruit from other areas within Central Scotland if I do not get the required numbers within Forth Valley.

17) Please describe the methods of analysis (statistical or other appropriate methods, e.g. for qualitative research) by which the data will be evaluated to meet the study objectives. (IRAS A62)

Using a relevant statistical package such as AMOS in SPSS, I plan to use path analysis to analyse the data.

Other Ethical Issues:

18 a) Do you intend to include any participants who are children?

No (Delete as applicable)

b) Do you intend to include any participants who are adults unable to consent for themselves through physical or mental incapacity?

No (Delete as applicable)

c) Do you intend to include any participants who are prisoners or young offenders?

No (Delete as applicable)

If "Yes" to any of the above, please justify their inclusion: (Derived from IRAS Project Filter)

19) (Delete as applicable)

a.	Will feedback/debriefing be provided	Yes
b.	Will subjects have the right to withdraw	Yes
c.	Will records remain confidential	Yes
d.	Will anonymity be ensured	Yes
e.	Will the study involve `deception'	No
f.	Will invasive procedures be included	No

If "*" to any of above, please outline why

I confirm that both my academic and clinical supervisors have seen and approved this ethics proposal. (Insert ‘yes’ below if true)

Yes

Date Thesis Proposal Submitted: April 24th 2009

6.2 Appendix 2: Letter from NHS Ethics

NHS Fife | NHS Forth Valley | NHS Tayside

- 3 SEP 2009

East of Scotland Research Ethics Service

Research Ethics Service Office
Residency Block
Level 2
Ninewells Hospital & Medical School
DUNDEE
DD1 9SY

Ms Emma Martin
Trainee Clinical Psychologist
NHS Forth Valley
Adult Clinical Psychology Service
Learning Disabilities Psychology Department
Falkirk Royal Infirmary
Major's Loan
FALKIRK
FK1 5QE

Date: 01 September 2009
Your Ref:
Our Ref:
Enquiries to: Mrs Lorraine Reilly
Extension: Ninewells extension 40099
Direct Line: 01382 740099
Email: lorraine.reilly@nhs.net

Dear Ms Martin

Re: Care agencies from Central Scotland who provide home-based residential care to adults with learning disabilities (Forth Valley, Glasgow and Mid/East Lothian)

You have sought advice from the Research Ethics Office on the above project. The Scientific Officer, Administration Manager and I have considered this and can advise that this does **not** require ethical review under the terms of the Governance Arrangement for Research Ethics Committees (GAfREC) in the UK. The advice is based on the following documentation provided to us:

Document	Version	Date
Email regarding further information		24 August 2009
Information Sheet		
Consent Form		
Questionnaire		
Original email		18 May 2009
Proposal		24 April 2008

- I have enclosed some guidelines on how to write a Participant Information Sheet for your information. This should be printed on headed paper with full date and version number as a footer. Please send a revised copy for our records.
- A Consent Form is not necessary as completing the questionnaire and participant sending it back implies consent.
- Confirmation that the questionnaire is anonymised.
- Regarding the questionnaire – this should be printed on headed paper with version number and full date as a footer.
- Also perhaps the titles with 'Research' in them could be changed to 'Study or Project'.

Please note that this advice is issued on behalf of the Research Ethics Service Office and does not constitute an opinion of a Research Ethics Committee (REC). It is intended to satisfy journal editors and conference organisers, who may require evidence of consideration of the need for ethical review prior to publication or presentation of your results.

POSITIVE ABOUT DISABLED PEOPLE

You should also note that if you deviate from the submitted documents in any way, this advice is void.

Please keep a copy of this letter within your project file.

Yours sincerely

L. Reilly

Mrs Lorraine Reilly
Assistant Administration Manager for
Fife, Forth Valley & Tayside Research Ethics Service

6.3 Appendix 3: Letter to invite agencies to participate

Ms. Emma Martin
Trainee Clinical Psychologist
Learning Disability Psychology Services
Adult Clinical Psychology
Old Nurses Home
Falkirk Royal Infirmary
Majors Loan
Falkirk
FK1 5QE
Tel: 01324 614349
Email: e.martin@nhs.net

Dear Sir/Madam,

I am a final year trainee clinical psychologist employed by NHS Forth Valley and studying in the University of Edinburgh. As a part of our training, we complete a study in an area of interest that is clinically relevant. I am interested in the health of adults with intellectual disabilities, and in particular physical activity. The University of Edinburgh Clinical Psychology Ethics Committee has approved the study.

This study is a questionnaire-based study and it involves keyworkers of adults with intellectual disabilities filling out some short questionnaires about supporting service users to exercise. These questionnaires should take approximately 10 – 15 minutes to complete. The principle aim of the study is to identify the main factors that influence supporting people with intellectual disabilities to partake in exercise. It is hoped greater knowledge and understanding of these factors may inform future interventions for increasing access to exercise to improve both psychological and physical health of the service users. Feedback from completed study will be given to all agencies that take part.

I am hoping that your agency may consider taking part in my study. I am interested in recruiting staff who work in the Forth Valley area (Falkirk, Stirling and Clackmannan). All questionnaires will be anonymous. I plan to contact you by telephone about this project within the next two weeks. However, if you wish to contact me to discuss this before then, please do not hesitate to contact me using the contact details above.

Many thanks for your consideration in this matter.

Yours sincerely,

Ms. Emma Martin

Trainee Clinical Psychologist

6.4 Appendix 4: Participant Information, Consent Form and Questionnaire

Exercise Research – Information Sheet

I would like to invite you to take part in a study seeking your opinion about exercise.

This questionnaire asks about exercise and lifestyle. Many of the questions will ask about a person with learning disabilities. Your answers will be anonymous. The questionnaire will take between 5-10 minutes to complete. The questionnaire is divided into 5 parts. Parts 1-4 should be completed and returned in the first instance, and part 5 should be completed and returned in two weeks time. A stamped addressed envelope has been provided.

If you decide to take part, please answer the questions keeping in mind one client for whom you are a key-worker. Please complete only one questionnaire.

Please leave completed questionnaires in the box provided or return them to me by post at the address provided below. Please ensure you also return the consent form.

Completed questionnaires will be stored securely. They will only be accessed by the researcher working on this project. Participation in this research is voluntary. If you do decide to take part, you may withdraw from the study at any point. To withdraw, please contact me (contact details below) and quote the unique identifier (The day of the month you were born and the first two letters of your mother's first name).

We will be asking you to complete another short questionnaire in two week's time. So that we can match your questionnaires, while maintaining anonymity, could you please write down:

1. The day of the month you were born (e.g. 8th, 23rd, etc) _____

2. The first two letters of your mother's first name (e.g. AM for Amy) _____

If you wish to receive any further information about this research project, or about the outcome of this study, please complete and return the optional contact details sheet attached or do not hesitate to contact me:

Emma Martin
Trainee Clinical Psychologist
NHS Forth Valley
Adult Clinical Psychology Service
Learning Disabilities Psychology Department
Falkirk Royal Infirmary
Major's Loan

Falkirk
FK1 5QE
Telephone: 01324 614349

Your Contact Details (Optional)

If you wish to remain informed about this study please complete and return this optional contact details form.

Name:

Organisation:

Telephone no:

Email address:

Consent Form

If you would like to participate in this study, please return this completed section at the same time as you return your completed questionnaire.

I consent to take part in the above study. I feel satisfied with the information I have been given about the study and I understand that I may withdraw at any stage, for any reason, if I should wish to do so.

Please tick box ☐

Questionnaire – Part 1

For the purpose of this questionnaire, vigorous exercise will refer to activities that involve hard physical effort that make you breathe much harder than normal (e.g. running, fast cycling, aerobics, fast swimming, heavy lifting, playing football, badminton, tennis etc). Moderate exercise will refer to exercises that make you breathe somewhat harder than normal (e.g. cycling or swimming at a regular pace).

1) On how many days does your client do vigorous exercise per week?
   _____

   No Vigorous activities – skip to question 3

2) How much time does your client spend doing vigorous activities on one of these days?

   _____ hours per day

   _____ minutes per day

3) On how many days does your client do moderate activities per week? _____

   No moderate activities – skip to question 5

4) How much time does your client usually spend doing moderate activities on one of those days?

   _____ hours per day

   _____ minutes per day

5) How many days a week does your client walk for at least 10 minutes at a time? _____

6) How much time does your client usually spend walking on these days?

7) How much time does your client spend sitting on a week day?

   _____ hours per day

   _____ minutes per day

Questionnaire – Part 2

I would like to ask you some questions on your client's exercise.

- The Health Education Board for Scotland encourages those who are inactive to partake in at least 30 minutes of moderate exercise (activities that make you breathe somewhat harder than normal) at a minimum of 5 times a week

- Exercise includes activities such as aerobics, badminton, football, going to the gym, jogging, etc. but not activities that form part of your everyday life such as walking to the bus stop, dancing at clubs, etc.

Please could you answer the following questions on exercise and health whilst keeping in mind a client you are key-worker for?

	Not closely at all						**Very Closely**
Q1) On average, over the past year how closely has your client kept to the recommended exercise guidelines outlined above?	1	2	3	4	5	6	7
Q2) How closely do you intend to keep to these recommendations **for your client** during the next year?	1	2	3	4	5	6	7

Please could you tell us how unlikely or likely you find the following statements.

Q3) For my client, engaging in exercise during the next year will:	**Very unlikely**						**Very likely**
Control their weight.	1	2	3	4	5	6	7
Give them more energy.	1	2	3	4	5	6	7
Keep them in good shape.	1	2	3	4	5	6	7
Aid their concentration.	1	2	3	4	5	6	7
Improve their behaviour.	1	2	3	4	5	6	7
Help their long term health prospects.	1	2	3	4	5	6	7
Improve their integration in the community.	1	2	3	4	5	6	7
Help them feel good about themselves.	1	2	3	4	5	6	7
Reduce their chances of obesity.	1	2	3	4	5	6	7
Reduce self-injurious behaviour.	1	2	3	4	5	6	7

Q4) How important to you is:	**Not important at all**						**Very important**
Controlling your client's weight?	1	2	3	4	5	6	7
Giving your client more energy?	1	2	3	4	5	6	7
Keeping your client in good shape?	1	2	3	4	5	6	7
Aiding your client's concentration?	1	2	3	4	5	6	7
Improving your client's behaviour?	1	2	3	4	5	6	7
Helping your client's long term health prospects?	1	2	3	4	5	6	7
Improving your client's integration into the community?	1	2	3	4	5	6	7
Helping your client to feel good about themselves?	1	2	3	4	5	6	7
Reducing your client's chances of obesity?	1	2	3	4	5	6	7
Reducing your client's self injurious behaviour?	1	2	3	4	5	6	7

Q5)

	Disapprove						Approve	N/A
Does your client disapprove /approve with engaging in exercise?	1	2	3	4	5	6	7	
Does your client's family disapprove/approve about your client engaging in exercise?	1	2	3	4	5	6	7	
Do other staff disapprove /approve of your client engaging in exercise?	1	2	3	4	5	6	7	
Does management disapprove /approve of your client engaging in exercise?	1	2	3	4	5	6	7	

Q6) How often do you feel:	**Never**						**Frequently**
I do not have enough time to support my client to engage in exercise.	1	2	3	4	5	6	7
Supporting my client to engage in exercise costs too much money.	1	2	3	4	5	6	7
Supporting my client to engage in exercise is inconvenient.	1	2	3	4	5	6	7
I don't always know what services are available for my client to engage in exercise.	1	2	3	4	5	6	7
Supporting my client to engage in exercise means having arguments with my client that I would rather avoid.	1	2	3	4	5	6	7
Supporting my client to engage in exercise means that I have to exercise.	1	2	3	4	5	6	7
Supporting my client to engage in exercise doesn't matter because they choose their own activities.	1	2	3	4	5	6	7
Supporting my client to engage in exercise is difficult due to staffing issues.	1	2	3	4	5	6	7
Supporting my client to engage in exercise is difficult due to transport issues.	1	2	3	4	5	6	7

Q7) How likely are these factors to stop you from supporting your client to engage in exercise?	**Very unlikely**						**Very likely**
Not having enough time.	1	2	3	4	5	6	7
Costing too much money.	1	2	3	4	5	6	7
Inconvenience.	1	2	3	4	5	6	7
Not always knowing which activities are available.	1	2	3	4	5	6	7
Having arguments with my client that I would rather avoid.	1	2	3	4	5	6	7
Having to exercise.	1	2	3	4	5	6	7
Your client choosing their activities for themselves.	1	2	3	4	5	6	7
Staffing issues.	1	2	3	4	5	6	7
Transport issues.	1	2	3	4	5	6	7

Q8) When supporting my client to exercise, I want to do what:	**Strongly disagree**						**Strongly agree**	**N/A**
My client approves of	1	2	3	4	5	6	7	
My client's family approves of	1	2	3	4	5	6	7	8
Other staff approve of	1	2	3	4	5	6	7	
Management approves of.	1	2	3	4	5	6	7	

Questionnaire – Part 3

Please answer the following questions on your thoughts about exercising <u>at least three times</u> over the next week.

1. Supporting my client to exercise at least three times over the next week would be…

Good 1 2 3 4 5 6 7 Bad

2. If I wanted to, I could easily support my client to exercise at least three times over the next week.

Unlikely 1 2 3 4 5 6 7 Likely

3. People who are important to me would approve/disapprove of me supporting my client to exercise at least three times over the next week...

Approve 1 2 3 4 5 6 7 Disapprove

4. Do you intend to support your client to exercise at least three times over the next week?

Definitely 1 2 3 4 5 6 7 Definitely
intend not to intend to

5. How much control do you have over whether or not you support your client to exercise at least three times over the next week?

Complete 1 2 3 4 5 6 7 No control
control

6. People who are important to me think I should/should not support my client to exercise at least three times over the next week...

Think 1 2 3 4 5 6 7 Think I should
I should not

7. Supporting my client to exercise at least three times over the next week would be…

Foolish 1 2 3 4 5 6 7 Wise

8. How confident are you that you could support your client to exercise at least three times over the next week, if you wanted to?

Not at all 1 2 3 4 5 6 7 Extremely

9. Whether or not I support my client to exercise at least three times over the next week is entirely up to me.

Agree 1 2 3 4 5 6 7 Disagree

10. I intend to support my client to exercise at least three times over the next week.

Definitely 1 2 3 4 5 6 7 Definitely
intend not intend to

11. Supporting my client to exercise at least three times over the next week would be…

Enjoyable 1 2 3 4 5 6 7 Unenjoyable

12. I feel under social pressure to support my client to exercise at least three times over the next week...

Agree 1 2 3 4 5 6 7 Disagree

13. For me, supporting my client to exercise at least three times over the next week would be…

Easy 1 2 3 4 5 6 7 Difficult

14. How likely is it that you will support your client to exercise at least three times over the next week?

Very 1 2 3 4 5 6 7 Very likely
unlikely

15. Supporting your client to exercise at least three times over the next week would be…

Pleasant 1 2 3 4 5 6 7 Unpleasant

16. I feel in complete control over whether or not I support my client to exercise at least three times over the next week.

Agree 1 2 3 4 5 6 7 Disagree

17. Supporting my client to exercise at least three times over the next week would be

Harmful 1 2 3 4 5 6 7 Beneficial

Questionnaire – Part 4

I would like to ask you some more general questions about you and your client.

Q1) Please tell me if there are any physical disabilities your client has:

_____

Q2) Please tell me how many hours per week you personally (not the organisation) support the client:

I support my client _____ hours per week.

Q3) Please tell me how many hours per week your organisations supports your client:

My organisation supports my client _____ hours per week.

Q4) Please select your age:

Your age	**Please tick**
18-24	
25-34	
35-44	
45-54	
55-64	
65+	

Q5) Please select your gender

Your gender	**Please tick**
Male	
Female	

Q6) Please select your client's age:

Your client's age	**Please tick**
18-24	
25-34	
35-44	
45-54	
55-64	
65+	

Q7) Please select your client's gender:

Your client's gender	**Please tick**
Male	
Female	

Q8) Please list below if there are any other factors that you think influence the amount of exercise that your client does.

Questionnaire – Part 5

This part should be completed and returned to the researcher TWO WEEKS after parts 1 – 4.

For the purpose of this questionnaire, vigorous exercise will refer to activities that involve hard physical effort that make you breathe much harder than normal (e.g. running, fast cycling, aerobics, fast swimming, heavy lifting, playing football, badminton, tennis etc). Moderate exercise will refer to exercises that make you breathe somewhat harder than normal (e.g. cycling or swimming at a regular pace).

So that we can match your questionnaires, while maintaining anonymity, could you please write down:

1. The day of the month you were born (e.g. 8th, 23rd, etc) _____

2. The first two letters of your mother's first name (e.g. AM for Amy) _____

- In the last two weeks, on how many days did your client do vigorous exercise? _____

  No Vigorous activities – skip to question 3

- How much time did your client spend doing vigorous activities on these days?

  _____ hours per day

  _____ minutes per day

- In the last two weeks, on how many days did your client do moderate activities per week? _____

  No moderate activities – skip to question 5

- How much time did your client usually spend doing moderate activities on one of those days?

  _____ hours per day

  _____ minutes per day

- In the last two weeks, how many days a week did your client walk for at least 10 minutes at a time? _____

- How much time did your client usually spend walking on these days?

_____ hours per day

_____ minutes per day

- In the last two weeks, how much time did your client spend sitting on a week day?

  _____ hours per day

  _____ minutes per day

Thank you for taking the time to participate in this study

6.5 Appendix 5: Feedback about questionnaires

(Francis *et al.*, 2004)

- Are any items ambiguous or difficult to answer?
- Does the questionnaire feel too repetitive?
- Does it feel too long?
- Are there any annoying features in the wording or formatting?

6.6 Appendix 6: Addendum to Ethics Proposal

Care agencies from central Scotland who provide home-based residential care to adults with learning disabilities (Forth Valley, Glasgow and Mid/East Lothian)

Trainee:	Emma Martin
Clinical Supervisor:	Keith Bowden
Academic Supervisor:	Emily Newman

As an addendum to my research ethics proposal dated 18th May 2009, I would like to add the following to methodology section of this form.

The questionnaires will be available in an online form for people who would prefer to complete them this way.

In addition to the initial form of recruitment, the online questionnaires will be made available on several internet forums. These forums include the learning disability forum and clinpsy (a forum for aspiring clinical psychologists many of whom work in support work).

6.7 Appendix 7: Post on forums inviting participants

Dear Participant,

I would like to invite you to take part in a study seeking your opinion about exercise and people with learning disabilities. If you are a keyworker for an individual with a learning disability who lives either on their own or in a shared home with other people with physical or intellectual disabilities you are eligible to take part in this study. Please do not take part if you support a person with a learning disability who resides in a hospital. This is because people who reside in such residences are less likely to have control over their activities. If there is more than one care agency involved in the individual's care please do not take part, this is to avoid crossover between the charitable/voluntary organisations already involved in the research study.

This questionnaire asks about exercise and lifestyle. Many of the questions will ask about a person with learning disabilities. Your answers will be anonymous. The questionnaire will take between 5-10 minutes to complete.

The questionnaire is divided into 2 parts. You should complete the first part immediately. The link for part 2 is also in this post. I would like you to complete this in two weeks. You may find it helpful to write a note in your diary or set a reminder on your phone.

The link for the first part of the study is:
https://www.survey.ed.ac.uk/forumexerciseld

The link for the second part of the study is:
https://www.survey.ed.ac.uk/part2

Thank you for your participation!

Emma Martin
Trainee Clinical Psychologist/Specialist Psychological Practitioner

NHS Forth Valley/University of Edinburgh

6.8 Appendix 8: Reminder post on forum

Hello again,

I just wanted to remind people about this survey - if you have filled in Part one - thank you so much, and if you could remember to do part two as well I would be so grateful.

I am recruiting until the end of May so if you want to take part please do so.

Thank you!

Emma

6.9 Appendix 9: Output from AMOS

Analysis Summary
Date and Time
Date: 03 August 2010
Time: 22:24:22
Title
Normanandconneraug3: 03 August 2010 10:24 PM

Number of variables in your model: 7
Number of observed variables: 5
Number of unobserved variables: 2
Number of exogenous variables: 5
Number of endogenous variables: 2

	Weights	Covariances	Variances	Means	Intercepts	Total
Fixed	2	0	0	0	0	2
Labeled	0	0	0	0	0	0
Unlabeled	5	3	5	0	0	13
Total	7	3	5	0	0	15

Number of distinct sample moments: 15
Number of distinct parameters to be estimated: 13
Degrees of freedom (15 - 13): 2

			Estimate	S.E.	C.R.	P	Label
INT	<---	PBC	.475	.099	4.782	***	
INT	<---	SN	.217	.123	1.764	.078	
INT	<---	ATT	.413	.147	2.813	.005	
Exercise	<---	PBC	.193	.075	2.583	.010	
Exercise	<---	INT	.080	.070	1.142	.253	

			Estimate
INT	<---	PBC	.447
INT	<---	SN	.166
INT	<---	ATT	.259
Exercise	<---	PBC	.331
Exercise	<---	INT	.146

			Estimate	S.E.	C.R.	P	Label
PBC	<-->	ATT	.555	.200	2.778	.005	
PBC	<-->	SN	.786	.248	3.172	.002	
SN	<-->	ATT	.475	.163	2.912	.004	

			Estimate
PBC	<-->	ATT	.334
PBC	<-->	SN	.388
SN	<-->	ATT	.352

	Estimate	S.E.	C.R.	P	Label
PBC	2.494	.402	6.205	***	
SN	1.648	.266	6.205	***	

	Estimate	S.E.	C.R.	P	Label
ATT	1.108	.179	6.205	***	
e1	1.529	.246	6.205	***	
e2	.689	.111	6.205	***	

	Estimate
INT	.459
Exercise	.188

	ATT	SN	PBC	INT
INT	.413	.217	.475	.000
Exercise	.033	.017	.231	.080

	ATT	SN	PBC	INT
INT	.259	.166	.447	.000
Exercise	.038	.024	.396	.146

	ATT	SN	PBC	INT
INT	.413	.217	.475	.000
Exercise	.000	.000	.193	.080

	ATT	SN	PBC	INT
INT	.259	.166	.447	.000
Exercise	.000	.000	.331	.146

	ATT	SN	PBC	INT
INT	.000	.000	.000	.000
Exercise	.033	.017	.038	.000

	ATT	SN	PBC	INT
INT	.000	.000	.000	.000
Exercise	.038	.024	.065	.000

Parameter			SE	SE-SE	Mean	Bias	SE-Bias
INT	<---	PBC	.105	.005	.476	.000	.007
INT	<---	SN	.124	.006	.229	.012	.009
INT	<---	ATT	.135	.007	.406	-.007	.010
Exercise	<---	PBC	.069	.003	.187	-.006	.005
Exercise	<---	INT	.060	.003	.079	-.001	.004

Parameter			SE	SE-SE	Mean	Bias	SE-Bias
INT	<---	PBC	.088	.004	.444	-.003	.006
INT	<---	SN	.096	.005	.175	.010	.007
INT	<---	ATT	.081	.004	.250	-.009	.006
Exercise	<---	PBC	.112	.006	.323	-.008	.008
Exercise	<---	INT	.102	.005	.140	-.006	.007

Parameter			SE	SE-SE	Mean	Bias	SE-Bias
PBC	<-->	ATT	.214	.011	.514	-.041	.015
PBC	<-->	SN	.253	.013	.767	-.019	.018
SN	<-->	ATT	.157	.008	.461	-.014	.011

Parameter	SE	SE-SE	Mean	Bias	SE-Bias

Parameter	SE	SE-SE	Mean	Bias	SE-Bias
PBC <--> ATT	.109	.005	.312	-.022	.008
PBC <--> SN	.121	.006	.385	-.002	.009
SN <--> ATT	.098	.005	.347	-.005	.007

Parameter	SE	SE-SE	Mean	Bias	SE-Bias
PBC	.302	.015	2.451	-.043	.021
SN	.230	.011	1.630	-.018	.016
ATT	.216	.011	1.067	-.041	.015
e1	.278	.014	1.480	-.049	.020
e2	.169	.008	.668	-.021	.012

Parameter	SE	SE-SE	Mean	Bias	SE-Bias
INT	.088	.004	.467	.008	.006
Exercise	.084	.004	.194	.006	.006

	ATT	SN	PBC	INT
INT	.135	.124	.105	.000
Exercise	.028	.018	.067	.060

	ATT	SN	PBC	INT
INT	.081	.096	.088	.000
Exercise	.030	.023	.099	.102

	ATT	SN	PBC	INT
INT	.135	.124	.105	.000
Exercise	.000	.000	.069	.060

	ATT	SN	PBC	INT
INT	.081	.096	.088	.000
Exercise	.000	.000	.112	.102

	ATT	SN	PBC	INT
INT	.000	.000	.000	.000
Exercise	.028	.018	.030	.000

	ATT	SN	PBC	INT
INT	.000	.000	.000	.000
Exercise	.030	.023	.048	.000

Iteration		Negative eigenvalues	Condition #	Smallest eigenvalue	Diameter	F	NTries	Ratio
0	e	0	57.811		9999.000	66.201	0	9999.000
1	e	0	15.295		.568	37.709	5	.000
2	e	0	8.314		.482	14.696	2	.000
3	e	0	7.072		.285	5.566	1	1.159
4	e	0	10.947		.168	4.35	1	1.135

Iteration		Negative eigenvalues	Condition #	Smallest eigenvalue	Diameter	F	NTries	Ratio
5	e	0	12.861		.055	14.279	1	1.050
6	e	0	12.436		.005	4.278	1	1.004
7	e	0	12.666		.000	4.278	1	1.000

Iterations	Method 0	Method 1	Method 2
1	0	0	0
2	0	0	0
3	0	0	0
4	0	0	0
5	0	2	0
6	0	28	0
7	0	58	0
8	0	54	0
9	0	36	0
10	0	17	0
11	0	4	0
12	0	1	0
13	0	0	0
14	0	0	0
15	0	0	0
16	0	0	0
17	0	0	0
18	0	0	0
19	0	0	0
Total	0	200	0

```
                        |-------------------
                  .010  |********************
                 2.156  |****************
                 4.301  |****************
                 6.446  |************
                 8.592  |************
                10.737  |******
                12.883  |*******
N = 200         15.028  |*****
Mean = 6.559    17.173  |**
S. e. = .416    19.319  |*
                21.464  |*
                23.610  |*
```

```
                  25.755  |*
                  27.900  |*
                  30.046  |*
                          |-------------------
                          |-------------------
                  10.646  |****
                  18.563  |***************
                  26.481  |*****************
                  34.398  |********
                  42.315  |****
                  50.232  |**
                  58.149  |*
N = 200           66.066  |*
Mean = 28.600     73.983  |*
S. e. = .989      81.901  |
                  89.818  |*
                  97.735  |
                 105.652  |
                 113.569  |
                 121.486  |*
                          |-------------------
                          |-------------------
                 -58.372  |*
                 -38.531  |***
                 -18.691  |*******
                   1.149  |**************
                  20.989  |******************
                  40.829  |*****************
                  60.669  |**************
N = 200           80.510  |**********
Mean = 43.924    100.350  |*****
S. e. = 3.316    120.190  |****
                 140.030  |****
                 159.870  |*
                 179.710  |*
                 199.551  |
                 219.391  |*
                          |-------------------
                          |-------------------
                  12.261  |*
                  23.333  |*********
                  34.405  |*****************
                  45.478  |**********
```

	56.550	|*******
	67.622	|*****
	78.694	|*
N = 200	89.766	|*
Mean = 44.446	100.838	|*
S. e. = 1.475	111.910	|*
	122.983	|
	134.055	|
	145.127	|*
	156.199	|
	167.271	|*
		|----------

Model	NPAR	CMIN	DF	P	CMIN/DF
Default model	13	4.278	2	.118	2.139
Saturated model	15	.000	0		
Independence model	5	94.516	10	.000	9.452

Model	RMR	GFI	AGFI	PGFI
Default model	.045	.979	.841	.131
Saturated model	.000	1.000		
Independence model	.634	.610	.416	.407

Model	NFI Delta1	RFI rho1	IFI Delta2	TLI rho2	CFI
Default model	.955	.774	.975	.865	.973
Saturated model	1.000		1.000		1.000
Independence model	.000	.000	.000	.000	.000

Model	PRATIO	PNFI	PCFI
Default model	.200	.191	.195
Saturated model	.000	.000	.000
Independence model	1.000	.000	.000

Model	NCP	LO 90	HI 90
Default model	2.278	.000	12.429
Saturated model	.000	.000	.000
Independence model	84.516	57.041	119.460

Model	FMIN	F0	LO 90	HI 90
Default model	.056	.030	.000	.161
Saturated model	.000	.000	.000	.000
Independence model	1.227	1.098	.741	1.551

Model	RMSEA	LO 90	HI 90	PCLOSE
Default model	.122	.000	.284	.166
Independence model	.331	.272	.394	.000

Model	AIC	BCC	BIC	CAIC
Default model	30.278	32.475	60.915	73.915
Saturated model	30.000	32.535	65.351	80.351

Model	AIC	BCC	BIC	CAIC
Independence model	104.516	105.362	116.300	121.300

Model	ECVI	LO 90	HI 90	MECVI
Default model	.393	.364	.525	.422
Saturated model	.390	.390	.390	.423
Independence model	1.357	1.001	1.811	1.368

Model	HOELTER .05	HOELTER .01
Default model	108	166
Independence model	15	19

Minimization:	.094
Miscellaneous:	1.466
Bootstrap:	.296
Total:	1.856

6.10 Appendix 10: Methods and Results of Smyth TPB Questionnaire

Information regarding the additional TPB questionnaire

The Smyth (2009) Theory of Planned Behaviour Questionnaire (TPB1)

The Smyth questionnaire was adapted from a questionnaire used by Chambers *et al.* (2007). This questionnaire measured past eating behaviour of clients, intentions of carers to encourage a healthy diet in the next year, the original components of the TPB and two extra variables of self-efficacy and self identity. Each factor was measured using a Likert scale from 1 – 7 where 7 represented the highest expected value and outcomes, with the exception of perceived behavioural control, where the scale was reversed and 1 represented the highest. This questionnaire was reported to have good face validity and acceptable internal reliabilities, with Cronbach's alpha values of 0.93 for attitudes, 0.80 for subjective norms and 0.92 for perceived behavioural control.

The original questionnaire by Chambers *et al.* (2007) was designed to examine what influences parental behaviour in giving their child a healthy diet. It included a section where the TPB was used. The TPB factors in the original questionnaire were found to have good face validity and acceptable reliability as indicated by Cronbach's alpha Scores of 0.96 for attitudes, 0.76 for subjective norms and 0.85 for perceived behavioural control. Scores above 0.7 are generally accepted as indicating good reliability (Field, 2005).

The author obtained permission from the authors of the original questionnaires for use with carers of adults with a learning disability.

This questionnaire had been adapted from an existing questionnaire that measured parental intentions to give their child a healthy diet (Chambers *et al*., 2007) Smyth (2009) adapted the questionnaire in order to measure the TPB with respect to carers of adults with learning disabilities and healthy eating. The Smyth (2009) questionnaire was adapted for the present research.

Attitudes and barriers to exercise that are measured in this questionnaire were extracted from the existing literature base in order to make the questionnaire relevant for exercise rather than diet. These attitudes and barriers were identified from the existing literature about exercise and people with learning disabilities, and from personal correspondence with professionals on the Community Learning Disability Team, including occupational therapists, physiotherapists, dieticians and nurses. The questions regarding attitudes were constructed through belief and evaluation questions. Belief questions were scaled from (+1) 'very unlikely' to (+7) 'very likely', and respondents were asked how likely they believed their client taking part in exercise was to lead to a number of specific outcomes. These included controlling their weight; giving them more energy; keeping them in good shape; aid their concentration; improve their behaviour; help their long-term health prospects; improve their integration in the community; help them feel good about themselves; reduce their chances of obesity and reduce self-injurious behaviour.

For perceived behavioural control, respondents were asked about their belief and evaluation in terms of perceived barriers. To elicit this information, those filling in the questionnaire were asked to respond to the following statements:

- I do not have enough time to support my client to exercise;
- Supporting my client to engage in exercise costs too much money;
- Supporting my client to engage in exercise is inconvenient;
- I don't always know what services are available for my client to engage in exercise;
- Supporting my client to exercise means arguments that I would rather avoid;
- Supporting my client to exercise means that I have to exercise;
- Supporting my client to exercise doesn't matter as they choose their own activities;
- Supporting my client to engage in exercise is difficult due to staffing issues;
- Supporting my client to exercise is difficult due to transport issues.

Results from TPB Questionnaire

The Theory of Planned Behaviour variables

Table 3.3 shows the mean, standard deviation and ranges for the variables measured by the TPB questionnaire.

Table 10.1: Summary of descriptives for the theory of planned behaviour variables

Questionnaire	**Variable**	**Mean (Standard Deviation)**	**Range**	**Positive Responses (%)**
Theory of Planned Behaviour Questionnaire Smyth (2009)	Intention (INT)	4.37 (2.22)	1 - 7	52.6
	Attitude (ATT)	5.17 (1.08)	2 – 7	60.3
	Subjective Norm (SN)	5.41 (1.19)	2 – 7	59
	Perceived Behavioural Control (PBC)	5.24 (1.17)	2 – 7	59

In addition, past physical activity behaviour and follow-up physical activity behaviour were measured using the IPAQ-SF. The IPAQ-SF recommends using the median and interquartile range when reporting the results as it tends not to be normally distributed. These variables are shown in Table 10.2.

Table 10.2: Summary of IPAQ-SF

Questionnaire	**Variable**	**Median (interquartile range)**	**Range**
IPAQ-SF	Past Behaviour	1066 (1670.25)	0 – 13860

	Follow up Behaviour	861.75 (1535)	0 – 10670

Bivariate Correlations

A correlation matrix was made using Pearson product-moment correlation to show the relationships between the TPB measures and past and follow-up physical activity. As outlined previously, in these and all further statistical analyses the transformed versions of variables will be used.

Table 10.3: Table to show correlations of the TPB variables and those of physical activity behaviour

		Theory of Planned Behaviour				Physical Activity	
		INT	ATT	SN	PBC	Past	Follow-up**
Theory of planned Behaviour	INT	1	0.31*	0.10	0.19	0.46*	0.22
	ATT		1	0.06	-0.12	0.30*	0.16
	SN			1	0.12	0.05	-0.25
	PBC				1	0.14	-0.03
Physical Activity	Past					1	0.49*
	Follow-up**						1

*Significant at p <0.01 (one-tailed)

**N = 28

The data showed that there was a significant positive relationship (r = 0.49, p <0.01) between past behaviour and follow-up behaviour measured at a two week follow up.

There was a significant positive relationship between past behaviour and intention ($r = 0.46$, $p < 0.01$). However, when using follow-up behaviour this relationship was not seen ($r = 0.22$, $p = 0.16$). Therefore, hypothesis 2, that past physical activity behaviour and follow-up physical activity behaviour would correlate with each other and intention was partially supported.

Due to the low response rate from the follow-up questionnaire, the initial IPAQ-SF which was used to measure past behaviour is used as a measure of physical activity behaviour in the analysis (c.f. Jenkins & McKenzie, 2010).

Path Analysis

Path analysis was used to assess hypotheses 3, 4 and 5. Hypothesis 3 stated that carers' intentions to support physical activity behaviour in clients with a learning disability will be predicted by carers' attitudes, subjective norms and perceived behavioural control. Hypothesis 4 stated that physical activity behaviour of individuals with a learning disability will be predicted by both carers' intentions to support this behaviour and their perceived behavioural control of this behaviour. Hypothesis 5 stated that attitude will be the strongest predictor of carers' intention to support clients with a learning disability to engage in physical activity.

Path analysis is an extension of multiple regression, and allows variables to act as both independent and dependent variables (Norman & Steiner, 1998). It provides information regarding the strength of relationships between variables, and it can be used to analyse and compare both direct and indirect effects (Allison, 1999).

Theory of Planned Behaviour Questionnaire

This section outlines the multiple regressions and the path analysis for the TPB questionnaire.

Table 10.4: Table to show regression weights of variables in path model in predicting intention and behaviour (as measured by past physical activity behaviour)

Outcome Variable	**Predictor** Variable	**Estimate of regression weight**	**Standard Error**	**Standardised Regression Weight (β)**	**P Value**
INT	**ATT**	0.678	0.217	0.333	0.002*
	SN	0.003	0.197	0.002	0.998
	PBC	0.434	0.201	0.231	0.031*
Past Behaviour	**INT**	0.189	0.043	0.452	0.001*
	PBC	0.043	0.081	0.055	0.592

*significant at $p < 0.01$

Table 10.4 shows the regression weights for the path diagram. In the first part of the analysis intention was the dependent variable and attitude, subjective norm and perceived behavioural control were the independent variables. Attitude and perceived behavioural control were significant predictors of carers' intentions to support their client to exercise in this regression. Attitude had the highest standardised coefficient, showing it contributed most to intention. Subjective norm was not a significant predictor of intention to support physical activity with the client.

In the second part of the analysis, past behaviour was the dependent variable and intention and perceived behavioural control were the independent variables. Perceived behavioural control was not a significant predictor of clients' behaviour. Intention was a significant predictor of past physical activity Figure 10.1 shows this information graphically.

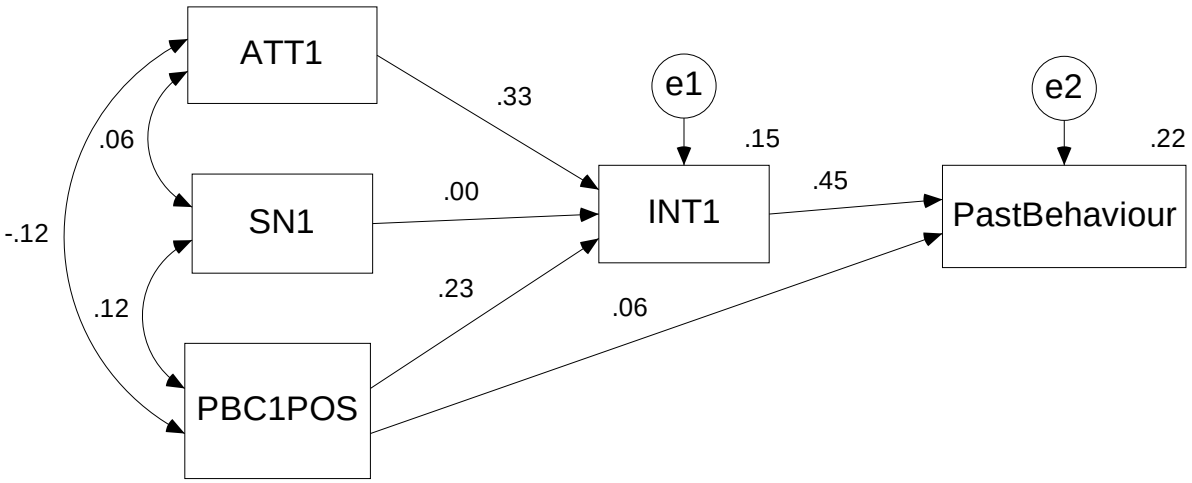


Figure 10.1: Path Diagram of the relationships between attitude, subjective norm, perceived behavioural control, intention and past behaviour, showing path coefficients and error terms

Figure 10.1 shows the path model used to assess hypotheses 3, 4 and 5 from the data collected using the TPB questionnaire. The path coefficients along each pathway are equivalent to the standardised β coefficients obtained from a multiple regression analysis (Bramwell, 1996). These coefficients indicate the strength of the relationship between the variables. The statistical significance of each of the path coefficients is outlined in Table 10.4. Error terms were also determined for each of the regression analysis within the path model. These are shown in the path diagrams at each dependent variable.

The path coefficients represent the strength of the relationship between each pair of variables. However, in path analysis, the indirect pathways between variables are also of interest, and these can be calculated by multiplying the path coefficients along each of the paths between relevant variables (Bramwell, 1996). Hypothesis 5 suggested that intention will act as a mediator variable in the model. A mediator variable can be described as one that explains the relationship between a predictor (independent) and an outcome (dependent) variable (Frazier *et al.,* 2004). Therefore,

to examine these hypotheses, the strength of the indirect pathways through intention was calculated and compared to the strength of direct relationships in the model. These relationships are shown in the Table 3.7.

Table 10.5: Table to illustrate the standardised direct and indirect effects of TPB variables on intention and exercise

		ATT	**SN**	**PBC**	**INT**
Standardised direct effects coefficients	INT	0.333	0.002	0.231	0
	PastBehaviour	0	0	0.043	0.189
Standardised indirect effects coefficients	INT	0	0	0	0
	PastBehaviour	0.151	0.001	0.105	0

The TPB model suggests that intention mediates the relationships between attitude, subjective norms and perceived behavioural control and behaviour. These indirect relationships did not support the notion that intention mediates the behaviour for these data.

The text output from the path analysis also contains the squared multiple correlations, which are equivalent to the r^2 that would be obtained using multiple regression. The squared multiple correlation therefore gives an estimate as to the amount of variance that can be explained by the regressions in the path analysis. The variables of attitude, subjective norm and perceived behavioural control explained 14.6 per cent of the variance of care workers' intentions to support people with a learning disability to partake in physical activity. The variables of perceived behavioural control and intention explained 21.7 per cent of the variance in the past physical activity behaviour of people with a learning disability.

The path model was evaluated for goodness-of-fit using the comparative fit index (CFI) as this is said to be reliable even with small sample sizes and the goodness-of-fit index (GFI). These should exceed 0.95 for a model that fits well (Hu & Bentlar, 1999). In addition, the standardised root mean square residual (SRMR) was

examined and this should be below 0.06 for a well-fitting model (Hu & Bentlar, 1999). The path model was an acceptable fit according the multiple criteria that were used ($\chi^2 = 3.30$, $df = 2$, p=0.192; CFI = 0.952; GFI = 0.983; SRMR = 0.044).